



OS X Terminal Services

Remotely Running OS X Desktop & Software
by Richard Glaser - University of Utah



J. Willard Marriott Library
THE UNIVERSITY OF UTAH

Who Am I?

- Richard Glaser
 - University of Utah
 - Head Apple Services & Support
 - Former MacOSXLabs Steering Member
 - Former MacEnterprise Steering Member
 - Administrate 600+ OS X Computers
 - Used by student, staff & faculty
 - Support a majority of the campus student labs
 - Laptops, Desktop, Kiosk, Presentation, Classrooms, etc.
 - Mobile Device Management (iOS & Others)
 - iTunes U
 - <http://itunesu.utah.edu>
 - Media Streaming (Wowza Media Server)
 - <http://stream.lib.utah.edu>
 - Classroom Recording (Podcast Producer Customization/Migration)
 - Many servers, and many other services/support...



Misnomers

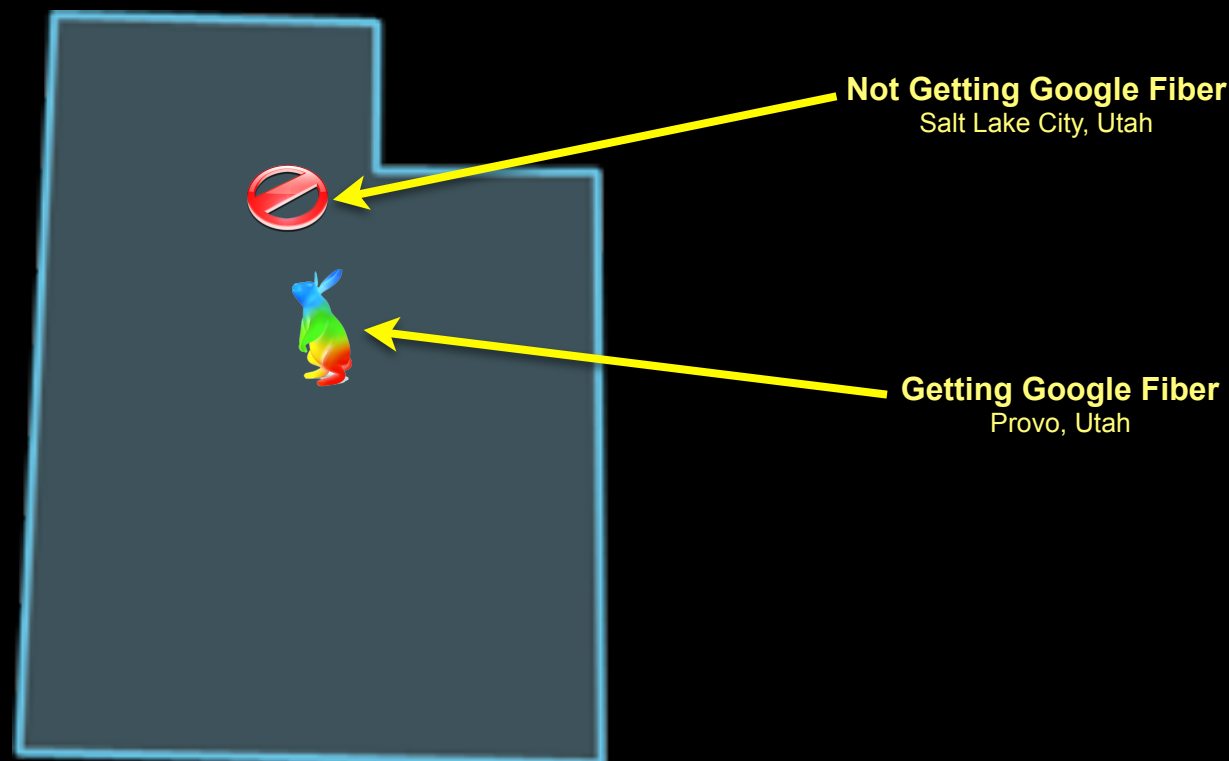




Misnomers

- No we're NOT getting Google Fiber
- Provo is getting it NOT Salt Lake City!!!

<https://fiber.google.com/cities/provo/>





Misnomers

- Most in SLC DON'T Ride Horse & Buggies

<http://www.carriageforhire.net>





Misnomers

- We all DON'T have multiple wives

http://historytogo.utah.gov/utah_chapters/pioneers_and_cowboys/historyofpolygamy.html

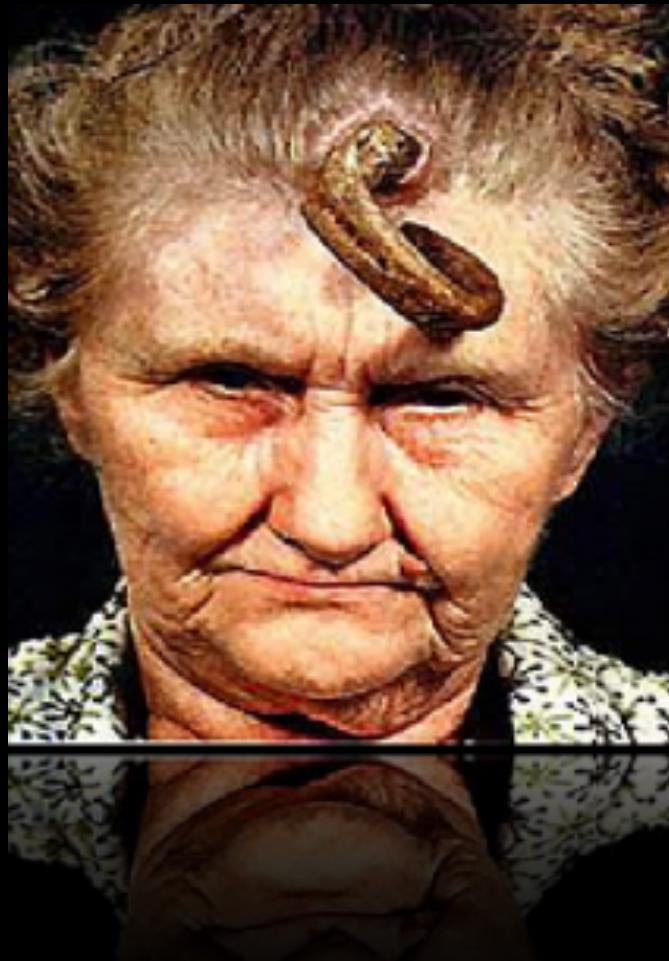




Misnomers

- Mormons DON'T have horns

<http://www.mormonzone.com/news.aspx?news=16>





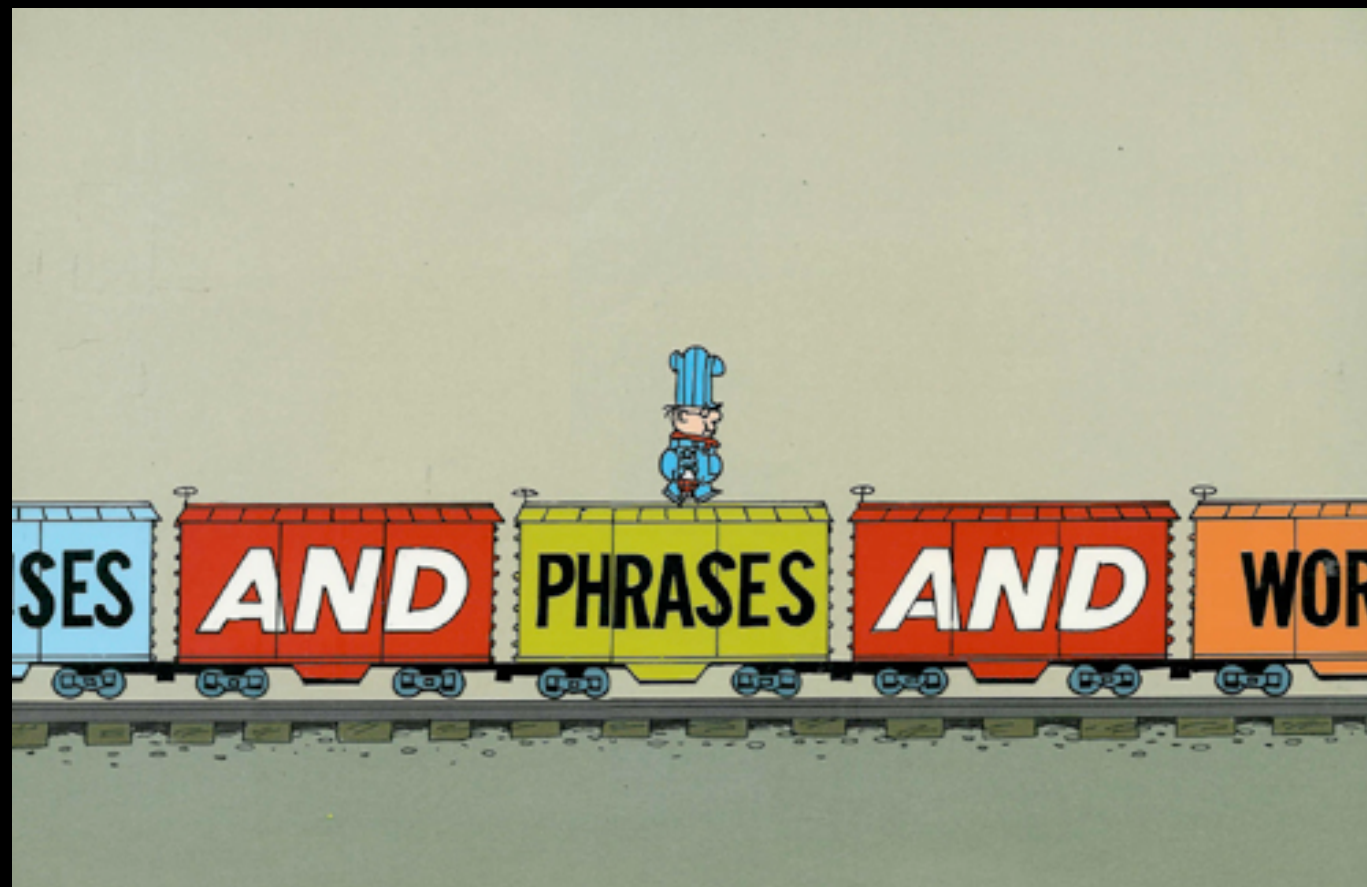
Misnomers

- And No I DO NOT Ski!!!

25 percent of Utahans skied or snowboarded in the past two years



Terms



Terms

- Terminal Services
 - Broadly describes technologies that allows a client to remotely access “remote desktop” and/or “published applications”.



Timbuktu



Apple Network Assistant



Apple Remote Desktop



Screen Sharing



Terms

- Remote Desktop
 - Often called “Desktop Virtualization” or “Desktop Streaming” separates the desktop environment and associated application software from the physical device accessing it.



Virtual PC



VMWare Fusion



Parallels Desktop



Virtual Box

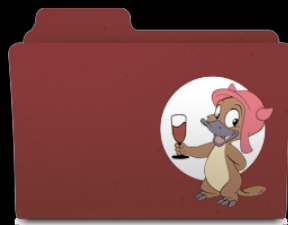


Terms

- Published Applications
 - Often called “Application Virtualization” or “Application Streaming” separates the software from the physical device they are used.



Wine



Darwine



CrossOver

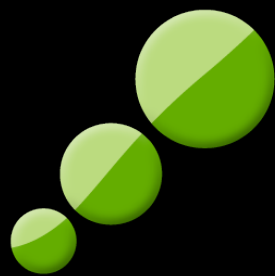


WineBottler



Terms

- Streamed Desktop/Applications
 - “Streamed Desktop” or “Applications” is a form of on-demand distribution. The necessary code and files are delivered over the network.



VMWare ThinApp



Terminal Services for Windows Server



Citrix XenApp



Terms

- Thin/Fat Client
 - A thin client is typically a network computer without a hard disk drive that depends on a server for all of its operations
 - A fat client includes a disk drive and usually has an operating system and can function independently of a server.



Background



Background

- Presentations about closing/reducing student labs
- University of Virginia - EDUCAUSE 2010

The screenshot shows the EDUCAUSE 2010 Annual Conference website. The header features the EDUCAUSE logo and navigation links: RESEARCH AND PUBLICATIONS, CONFERENCES AND EVENTS, CAREER DEVELOPMENT, FOCUS AREAS AND INITIATIVES, CONNECT AND CONTRIBUTE, and ABOUT EDUCAUSE. A search bar is located in the top right. Below the header, a breadcrumb trail reads: Home > EDUCAUSE 2010 Annual Conference > Phasing Out Public Computing Labs. The main title of the session is 'PHASING OUT PUBLIC COMPUTING LABS'. The session details for Wednesday, Oct 13th, 2010, from 2:30 PM to 3:20 PM Pacific Time in Ballroom D are displayed. The session type is 'IN THE HOT SEAT'. The description states: 'At first blush, sustained support for public computing labs would seem to be as close to a "no brainer" as is possible in the IT space. Students love them, judging by the amount of time they spend in them. At U. Va., however, we are entering the second year of a three-year project to retire the public computing labs in favor of a virtualized lab model. We are actively closing labs and reducing the number of seats available. In this session, we will discuss the reasons behind this decision, the challenges that it poses, and the reactions of students and faculty to this change.' Navigation tabs for Video, Speakers, Resources, and Location are at the bottom left. On the right, there are buttons for 'Return to the Agenda', 'RECOMMEND' (with a red 'E' icon), 'Log in to Recommend', and 'SHARE THIS' (with a share icon).

Background

- Escalating costs for specialized software

The screenshot shows the EDUCAUSEreview online website. The header features the EDUCAUSE logo, the tagline 'Why IT Matters to Higher Education', and the site name 'EDUCAUSEreview online'. A navigation bar includes links for Articles, Departments, Blogs, Multimedia, Topics, Print Edition, and About. A search bar is located in the top right corner. The main content area displays the article title 'Virtualizing Specialized Software' by Lauren McSwain-Starrett and Stephanie Scheer Conley, published on Tuesday, March 29, 2011. The article includes a 'Key Takeaways' section with four bullet points. A sidebar on the right features a Workday advertisement with the text 'The Enterprise Cloud for HR and Finance.'.

EDUCAUSE
"Bring Your Own"
In Print: Mar/Apr 2013
Cover Story
Features
Departments
Subscribe

Why IT Matters to Higher Education
EDUCAUSEreview online

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Articles Departments Blogs Multimedia Topics Print Edition About

Home > Articles > Virtualizing Specialized Software (EDUCAUSE Quarterly)

Virtualizing Specialized Software

by Lauren McSwain-Starrett and Stephanie Scheer Conley

Published on Tuesday, March 29, 2011 | 1 Comment

Share Log in to Recommend

Key Takeaways

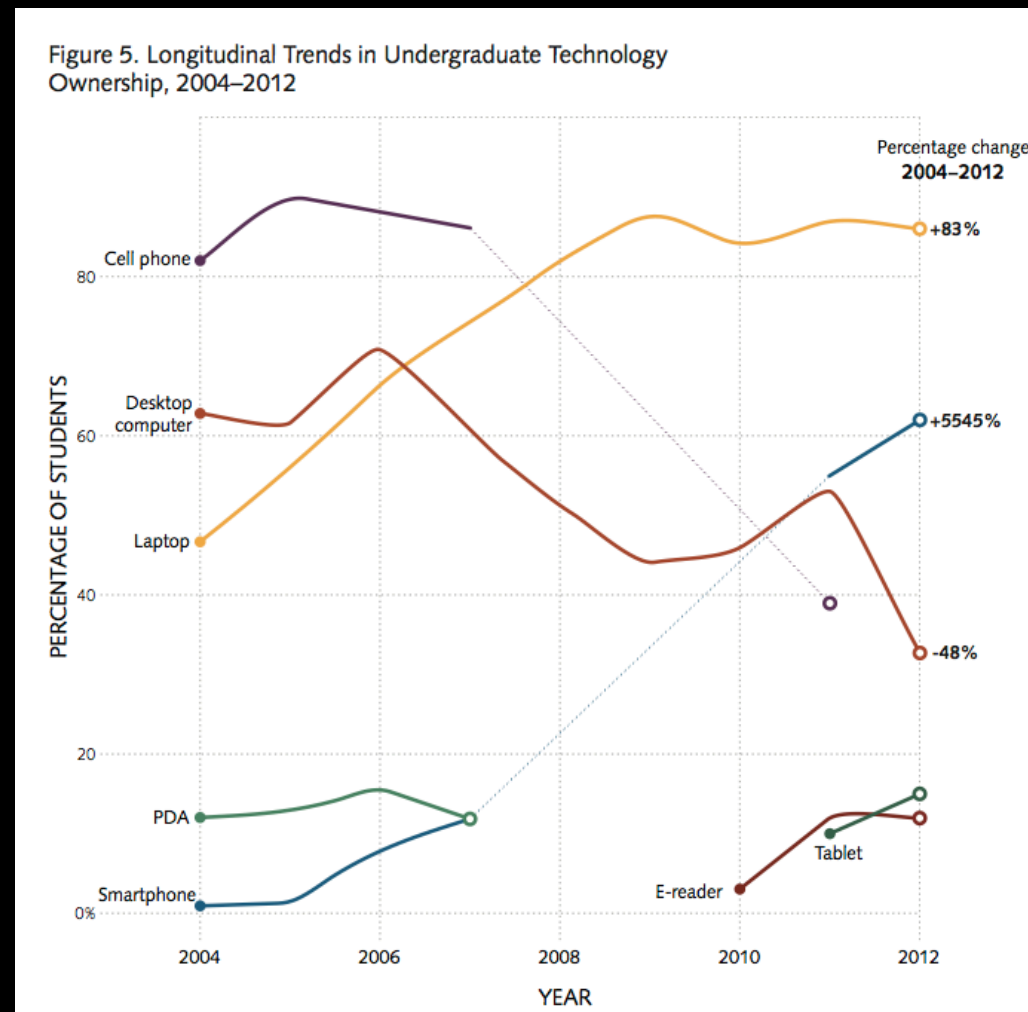
- With the shift of student computing away from fixed locations such as public computer labs and toward anywhere, anytime, on-demand mobile computing, colleges and universities must realign their computing services accordingly.
- Specialized software for computing—whether for mapping and imaging, design and modeling, computation and visualization, or statistical analysis—traditionally has been made available on computer lab systems, not widely distributed on students' personal devices.
- Virtualizing delivery of specialized software enables students to access the programs they need independent of location or time of day, while allowing institutions to reduce the number of computer lab machines provided and maintained for student use.
- The University of Virginia piloted two approaches to delivery of specialized software to students before settling on the system they call the Hive, which became a full production service in fall 2010.

workday

The Enterprise Cloud for HR and Finance.

Background

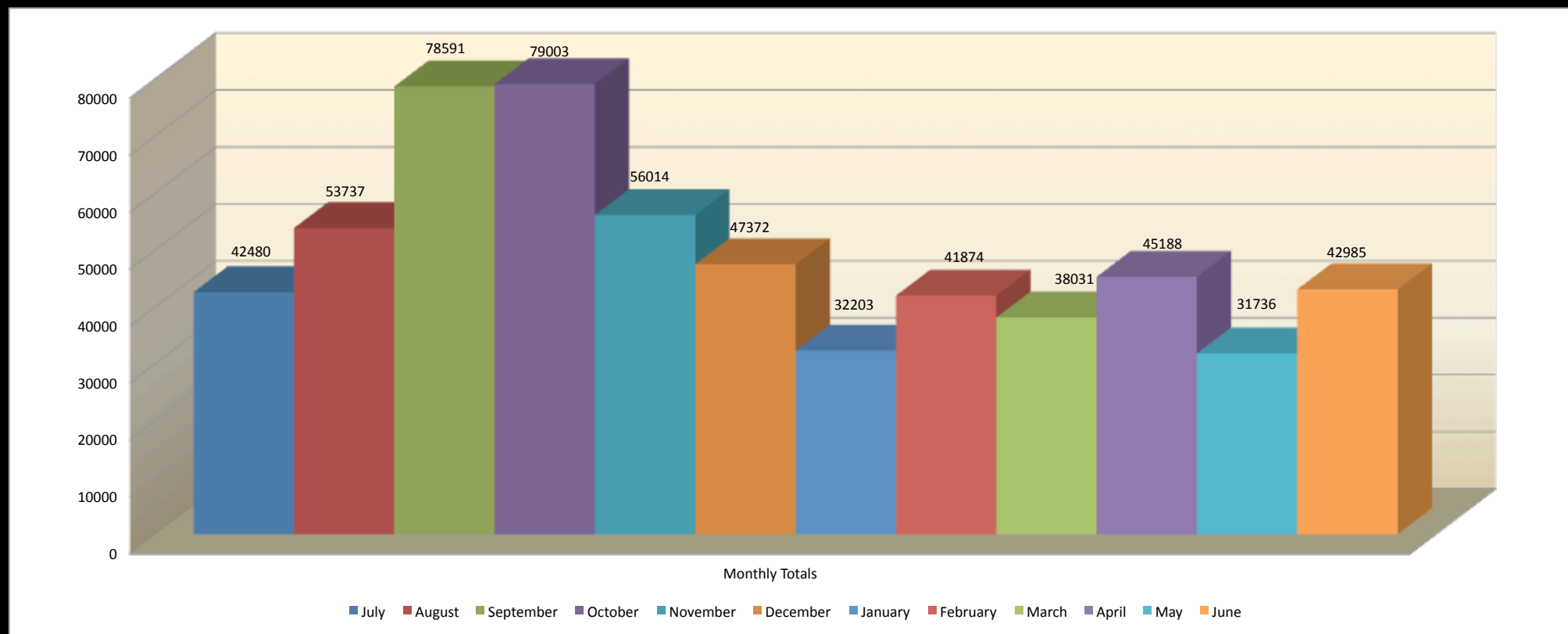
- Mobility - Demand for remotely accessing software anytime/anywhere



ECAR Study of Undergraduate Students and Information Technology, 2012
Undergraduate Students and IT, 2012

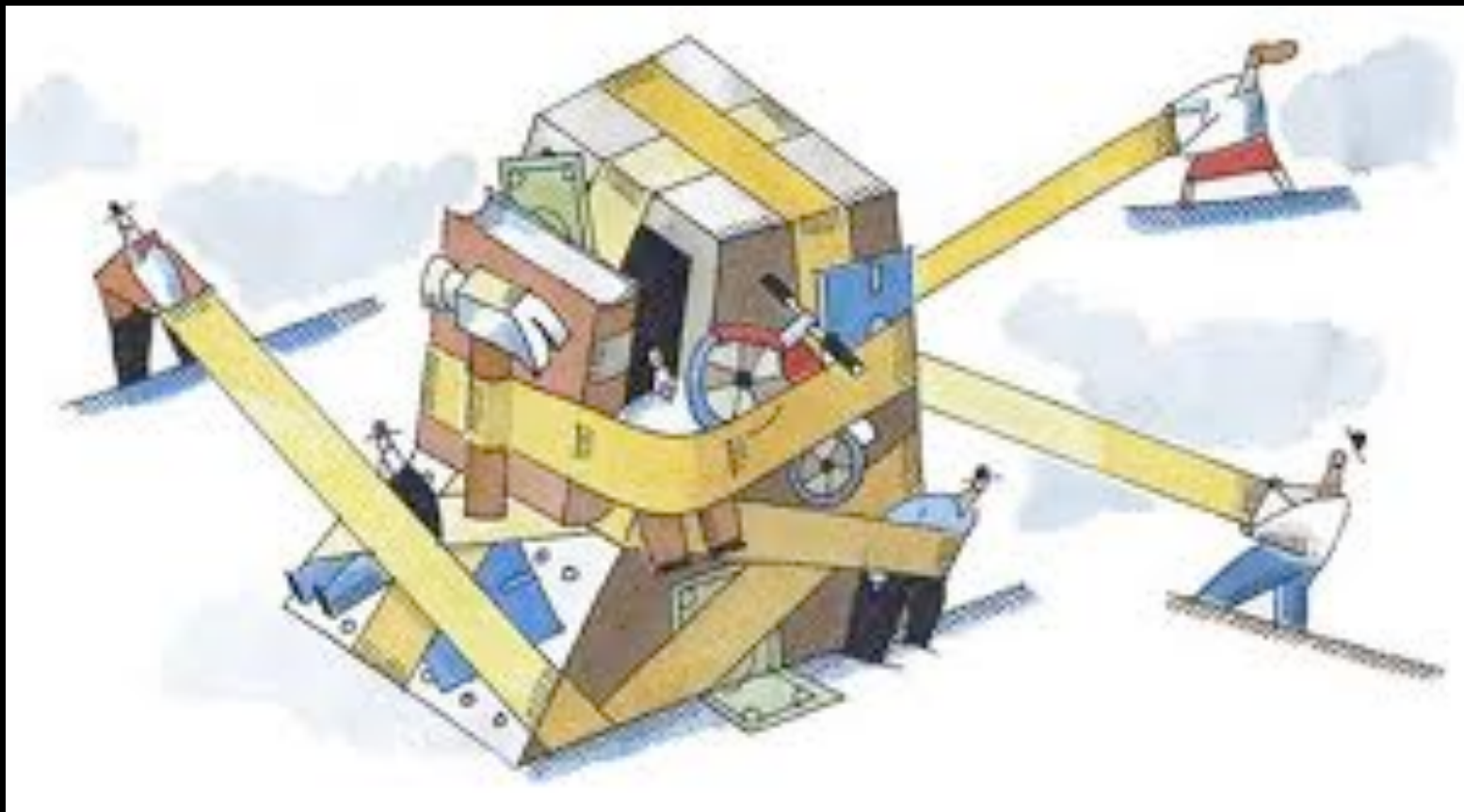
Background

- Utilization - Usage/Demand is decreasing?
 - Our residential labs are decreasing, but other labs increasing



Background

- Cost - Terminal Services Cheaper than Managed Desktops?



Plan

- Research & Develop Alternatives
 - Find cheaper alternatives to status quo options (i.e. VMWare/Citrix, etc.)
 - Provide remote access to OS X Desktop & Applications
 - Evaluated Support/Management, End-User Experience, etc.



Options



OS X Terminal Service Options



<http://www.aquaconnect.net>



iRAPP TS

<http://www.coderebel.com/products/irapp-terminal-server>



MacinCloud

<http://www.macincloud.com>



osxtsp

<http://code.google.com/p/osxtsp/>

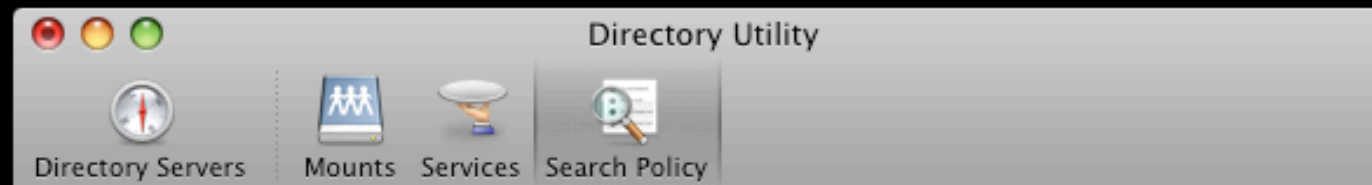


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OS X Terminal Service Options



- OS - depends on terminal server version
 - ACTS Version 2.0 - Mac OS X 10.4 (VNC Only)
 - Runs on PowerPC Hardware
 - ACTS Version 3.5 - Mac OS X 10.5/10.6
 - ACTS Version 3.7 - Mac OS X 10.7/10.8
 - ACTS Version 4.0 - Upcoming Release
- Protocols - X11, VNC, RDP & AAP (Aqua Accelerated Protocol)
 - AAP provides greatly increases speed & performance over other protocols
- Directory Services - Open Directory, Active Directory & LDAP
 - Ties into OS X's built in support for client authorization/authentication mechanisms



OS X Terminal Service Options



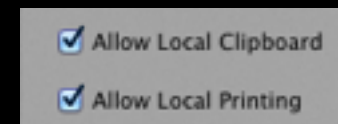
- Local Support

- Local audio, clipboard & printing supported
- Upcoming Release - Local File Access (AAP Only)



- Security

- Disable local printing/clipboard globally or per user
- Upcoming Release - Disable Local File Access (AAP Only)



- Encryption

- RDP - 128-bit encryption, using the RC4 encryption algorithm
- AAP - RSA 2048-bit & FIPS 140-2

RSA claims that 2048-bit keys will NOT be crackable until 2030

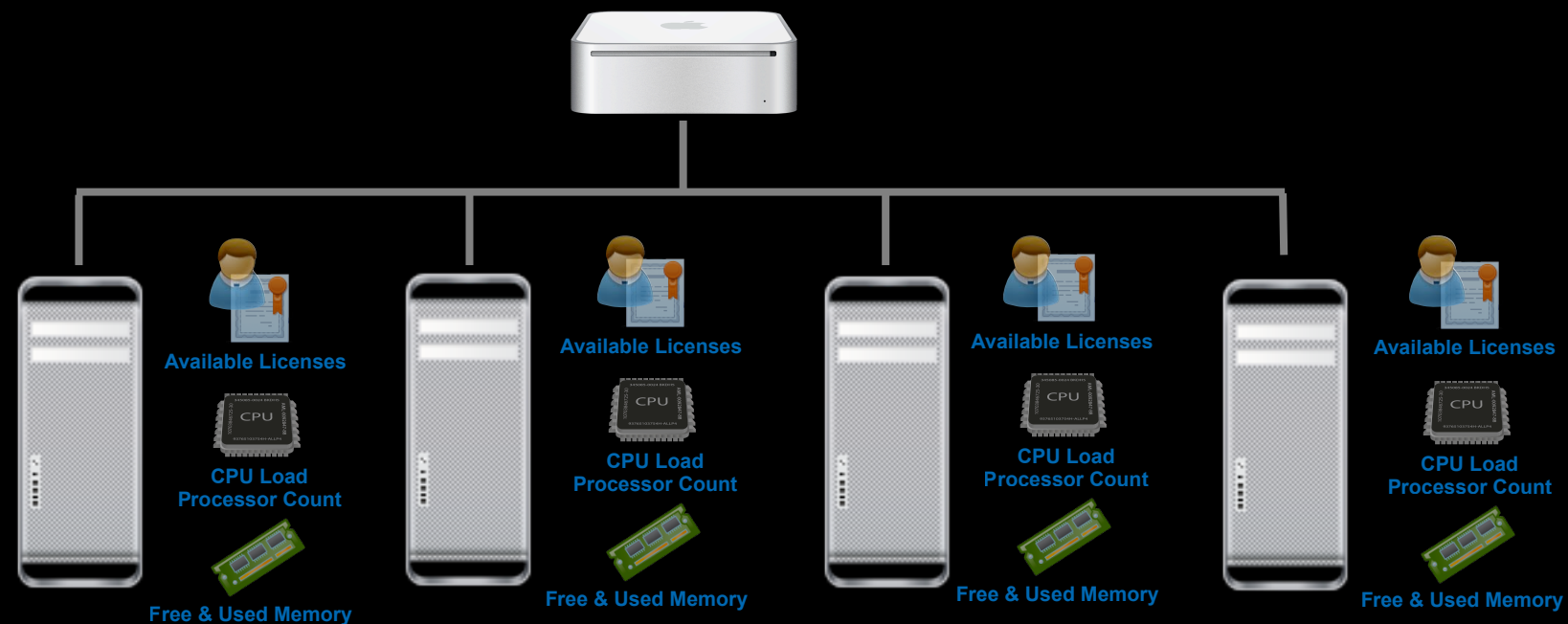
FIPS 140-2 is U.S. government computer security standard



OS X Terminal Service Options



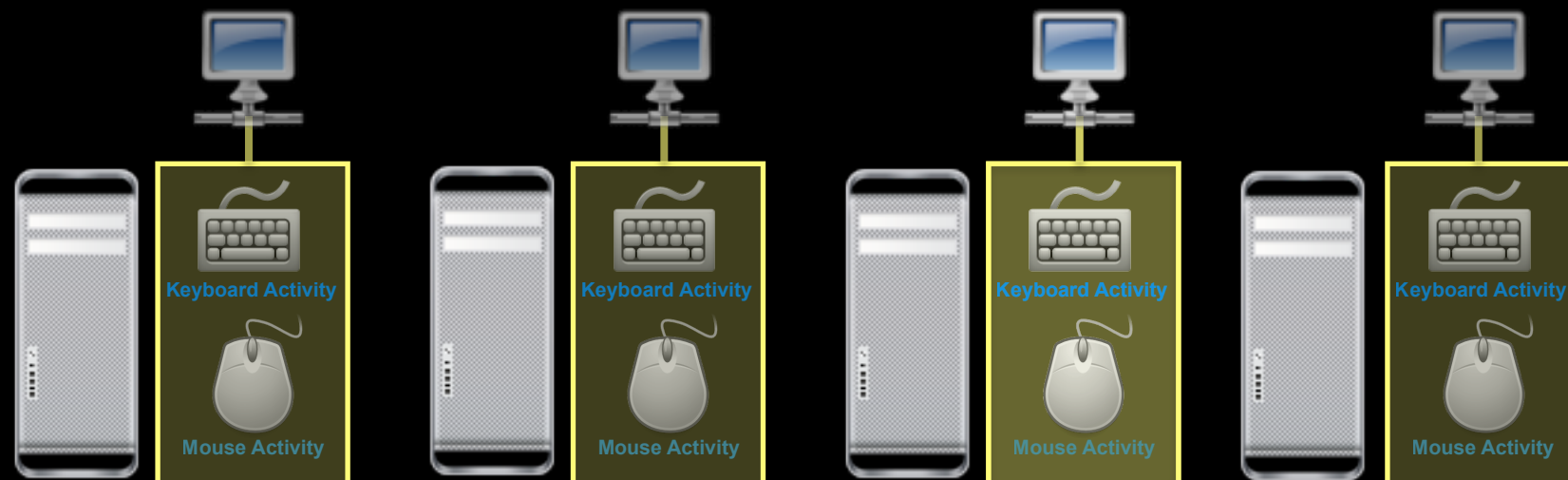
- Load Balancer - Aqua Connect Load Balancer
 - Load balancer uses data like cpu load, processor count, used/free memory, etc.
 - Runs on OS X 10.6, 10.7 & 10.8
 - Allows disabling servers for downtime/troubleshooting, etc.
 - Additional cost



OS X Terminal Service Options



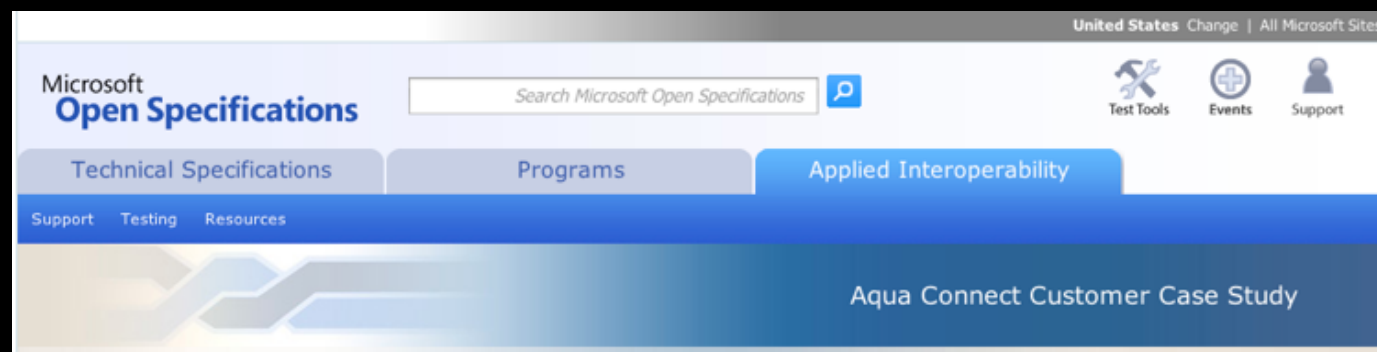
- Idle Sessions - Aqua Connect Time Out
 - Monitors Session Activity
 - Mouse Movement & Keyboard Activity
 - Doesn't monitor user activity, like application use for rendering, encoding, etc.



OS X Terminal Service Options



- Created first OS X Terminal Server in 2007
- Licensed Microsoft's RDP for Mac in 2008
- Received Best of VMworld 2010 nomination
- Microsoft RDP Case Study
http://www.microsoft.com/openspecifications/en/us/applied-interopability/resources/case-studies/aqua-connect_case-study/default.aspx
- Gartner 2011 Cool Vendor Award
<http://www.gartner.com/DisplayDocument?ref=clientFriendlyUrl&id=1644415>



OS X Terminal Service Options



- Over 400+ Licensees Around World!!!
<http://aquaconnect.net/case-studies>



OS X Terminal Service Options



- Notable Partners
<http://aquaconnect.net/partners/>



Partners provide technical, marketings & business development support & resources

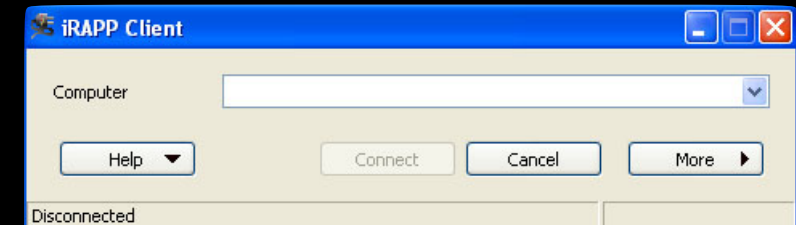
OS X Terminal Service Options



iRAPP TS

<http://www.coderebel.com/products/irapp-terminal-server>

- iRAPP = interactive Remote APPlication
- OS
 - iRAPP TS - Mac OSX 10.4/10.5/10.6/10.7/10.8
 - iRAPP - Mac OSX 10.4/10.5/10.6/10.7/10/8
 - iRAPP NOT supported Apple computers w/PowerPC processors.
- iRAAP TS
 - Supports multiple remote sessions
- iRAPP
 - Only supports single remote session
 - iRAPP client software only supported on Windows
 - Like alternative Screen Sharing solution



OS X Terminal Service Options



iRAPP TS

<http://www.coderebel.com/products/irapp-terminal-server>

- Protocols - RDP & iRAPP
 - Does NOT support VNC
- Directory Services - Open Directory, Active Directory & LDAP
 - Ties into OS X's built in support for client authorization/authentication mechanisms
- Local Support
 - Audio, clipboard & printing supported
- Load Balancer - iRAPP Proxy Server
 - More a "Round Robin" than "Load Balancer" system
 - Does NOT use memory usage, CPU load, processor count, etc.
 - Runs on multiple platforms like OS X, Windows and Linux (CentOS & Fedora 32/64 bit)
 - Included with iRAPP Server no additional charge



OS X Terminal Service Options



iRAPP TS

<http://www.coderebel.com/products/irapp-terminal-server>

- Security

- Disabling local printing global only - NOT per user
- Disabling local clipboard currently NOT supported



- Encryption

- RDP - 128-bit encryption, using the RC4 encryption algorithm
- iRAPP Client encryption is SSLv3



- Automatic Idle Sessions Termination - Not supported



OS X Terminal Service Options



iRAPP TS

<http://www.coderebel.com/products/irapp-terminal-server>

- Blend & Unite
Viewing OS X Programs without seeing OS X
 - Similar feature as VMWare Fusion Unity Mode or Parallels Coherence Mode
 - Only available with iRAPP client on Windows only, NOT available with RDP clients



OS X Terminal Service Options



iRAPP TS

<http://www.coderebel.com/products/irapp-terminal-server>

- Customers...



OS X Terminal Service Options



iRAPP TS

<http://www.coderebel.com/products/irapp-terminal-server>

- Code, code who's got the code?



CherryOS

<http://en.wikipedia.org/wiki/CherryOS>

Code Rebel iRAPP developer Arben Kryeziu was the chief architect who became infamous for the CherryOS scam for allegedly stealing PearPC's source code.

CherryOS was also alleged to have copied code from OpenVPN (using it as their network driver) and HFVExplorer (which was used as the "Drag 'n' Drop" interface).



Code Rebel

http://en.wikipedia.org/wiki/Code_Rebel

Code Rebel is in litigation for allegedly stealing Aqua Connect's source code



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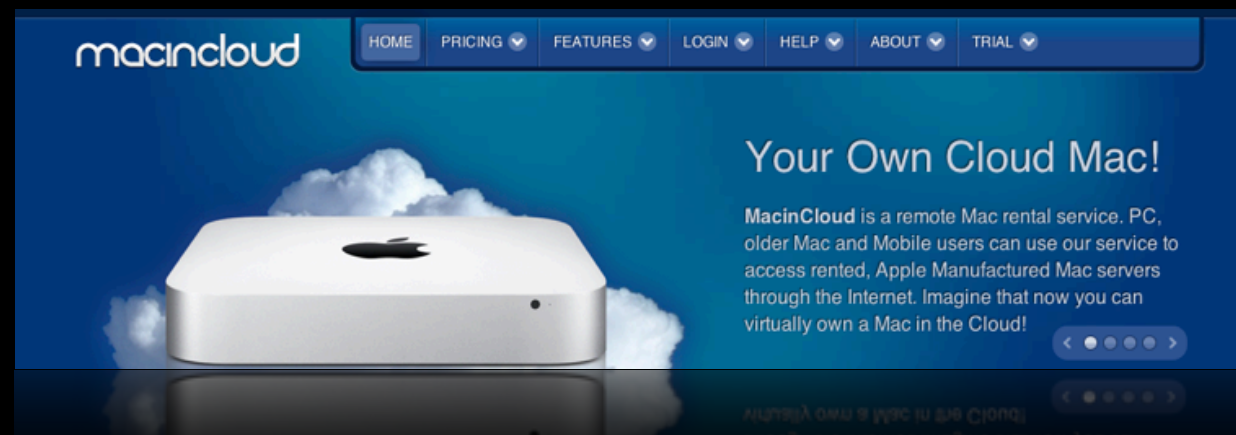
OS X Terminal Service Options



MacinCloud

<http://www.macincloud.com>

- Subscription or Timeshare Service
- Environment Aimed at Developers
- Default Software is Open Source or Freeware SDK's
- Impose Limits on Installing End-User Applications
 - Server “Stability or Security” Concerns
 - “Proper” Licensing



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OS X Terminal Service Options



osxtsp

<http://code.google.com/p/osxtsp/>

- Open Source
- Limited Functionality & Features

The screenshot shows the Google Code project page for osxtsp. The header includes the project name 'osxtsp' and subtitle 'Mac OS X Terminal Server Project'. Navigation links for 'Project Home', 'Downloads', 'Wiki', 'Issues', and 'Source' are present. The 'Summary' tab is active, displaying 'Project Information' on the left and a description on the right. The description states the project's aim is to provide an environment as close to LTSP / Windows Terminal Server as possible for the Mac OS X platform. It also mentions that the founder is successfully running a 4-client Mac OS X Terminal Server with various applications. The 'Project Information' sidebar includes a 'Recommend this on Google' button, 'Starred by 0 users', 'Project feeds', 'Code license GNU GPL v2', and 'Labels' such as 'osx', 'terminalserver', 'vnc', and 'thinclient'.

osxtsp
Mac OS X Terminal Server Project

[Project Home](#) [Downloads](#) [Wiki](#) [Issues](#) [Source](#)

Summary [People](#)

Project Information

Recommend this on Google

★ Starred by 0 users
[Project feeds](#)

Code license
[GNU GPL v2](#)

Labels
osx, terminalserver, vnc, thinclient

The aim of the OSX Terminal Server Project is to provide an environment as close to LTSP / Windows Terminal Server as is possible for the Mac OS X platform, allowing multiple thin clients to connect to a single Mac OS X based computer.

Although a proper Terminal Server application is a long way off, the founder of this project is successfully running a 4-client Mac OS X Terminal Server with the users running Safari, Mail, iCal and iChat regularly quite happily on terminals made out of old minimal spec PCs



Our Pilot Project



History

- Pilot Project 2011-2012

- Setup (2) Terminal Services Platforms



Ulteo - Linux/Windows Terminal Services

<http://www.ulteo.com>

Ulteo Open Virtual Desktop is an open source alternative to Citrix and VMWare solutions



Aqua Connect - OS X Terminal Services

<http://www.aquaconnect.net>



- 25 Aqua Connect Terminal Server Licenses
- Aqua Connect Load Balancer



- Software & Hardware Upgrades

- Used old retired lab Power Mac's, increased RAM & installed SSD's
- Worked with specific classes & software (i.e. Xcode, Vectorworks, Lightwright)

History

- **Pilot Project 2012-2013**

- Increased Terminal Services Capacity/Licenses



Ulteo - Linux/Windows Terminal Services

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Aqua Connect - OS X Terminal Services

<http://www.aquaconnect.net>



- Additional 25 Aqua Connect Terminal Server Licenses
- Total support for 50 concurrent connections



- Software & Hardware Upgrades
 - Used old retired lab Power Mac's, increased RAM & installed SSD's
 - Opened up project to more classes & campus



History

- In Near Future...

- Increased Terminal Services Capacity/Licenses



Ulteo - Linux/Windows Terminal Services

<http://www.ulteo.com>

Ulteo

Ulteo Open Virtual Desktop is an open source alternative to Citrix and VMWare solutions



Aqua Connect - OS X Terminal Services

<http://www.aquaconnect.net>



- Additional 50 Aqua Connect Terminal Server Licenses
- Total support for 100 concurrent connections
- Make available as production service on campus



Backend Setup



Backend Setup

Terminal Servers

Production

Mac Pro
2 x 2.66 GHz Dual-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Early 2008)
3.2 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Mid 2012)
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Terminal Server

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Terminal Server



Test Load Balancer

Mac Pro (Early 2009)
2.66 GHz Quad-Core Intel Xeon
6 GB RAM & 250 GB HD



Failover Load Balancer

Mac Pro (Early 2008)
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Load Balancer

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Failover Terminal Server

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Test Terminal Server

Mac Pro (Early 2009)
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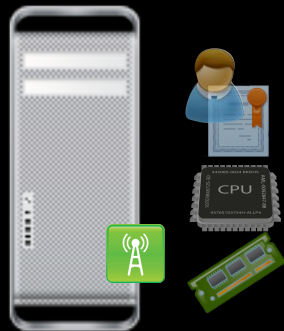
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Backend Setup

Terminal Servers

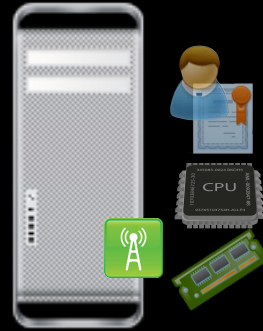
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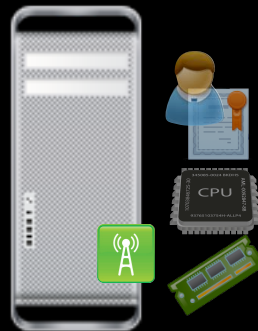
Terminal Server

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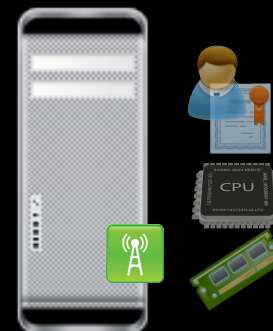
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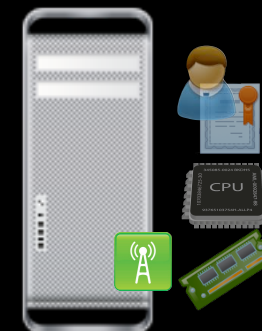
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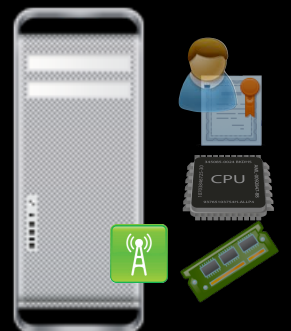
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Terminal Server

Load Balancer

Production



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**Monitors
Resources
and
Connects
to Server
with Least
Resources**



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Terminal Server
Failover



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Mac Pro (Early 2008)
2 x 2.8 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server
Development

Test Terminal Server

Mac Pro (Early 2009)
2.66 GHz Quad-Core Intel Xeon
16 GB RAM & 250 GB SSD



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Backend Setup

Mac Pro
2 x 2.66 GHz Dual-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Early 2008)
3.2 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Mid 2012)
3.2 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



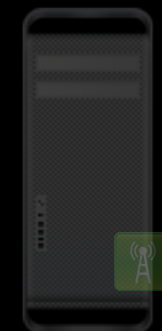
Terminal Server

Mac Pro (Mid 2010)
2 x 2.4 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Mid 2010)
2 x 2.4 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Mid 2010)
2 x 2.4 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Load Balancer
Failover



Failover Load Balancer

Mac Pro (Early 2009)
2.66 GHz Quad-Core Intel Xeon
6 GB RAM & 250 GB HD



Test Load Balancer



Load Balancer

Mac Pro (Early 2008)
2 x 2.8 GHz Quad-Core Intel Xeon
8 GB RAM & 250 GB HD



Failover Terminal Server

Mac Pro (Early 2008)
2 x 2.8 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Test Terminal Server

Mac Pro (Early 2009)
2.66 GHz Quad-Core Intel Xeon
16 GB RAM & 250 GB SSD



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Backend Setup

Mac Pro
2 x 2.66 GHz Dual-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Early 2008)
3.2 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Mid 2012)
3.2 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Mid 2010)
2 x 2.4 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Mid 2010)
2 x 2.4 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Mac Pro (Mid 2010)
2 x 2.4 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Terminal Server

Load Balancer
Development



Test Load Balancer

Mac Pro (Early 2009)
2.66 GHz Quad-Core Intel Xeon
6 GB RAM & 250 GB HD



Failover Load Balancer

Mac Pro (Early 2008)
2 x 2.8 GHz Quad-Core Intel Xeon
8 GB RAM & 250 GB HD



Load Balancer

Mac Pro (Early 2008)
2 x 2.8 GHz Quad-Core Intel Xeon
8 GB RAM & 250 GB HD



Failover Terminal Server

Mac Pro (Early 2008)
2 x 2.8 GHz Quad-Core Intel Xeon
32 GB RAM & 250 GB SSD



Test Terminal Server

Mac Pro (Early 2009)
2.66 GHz Quad-Core Intel Xeon
16 GB RAM & 250 GB SSD



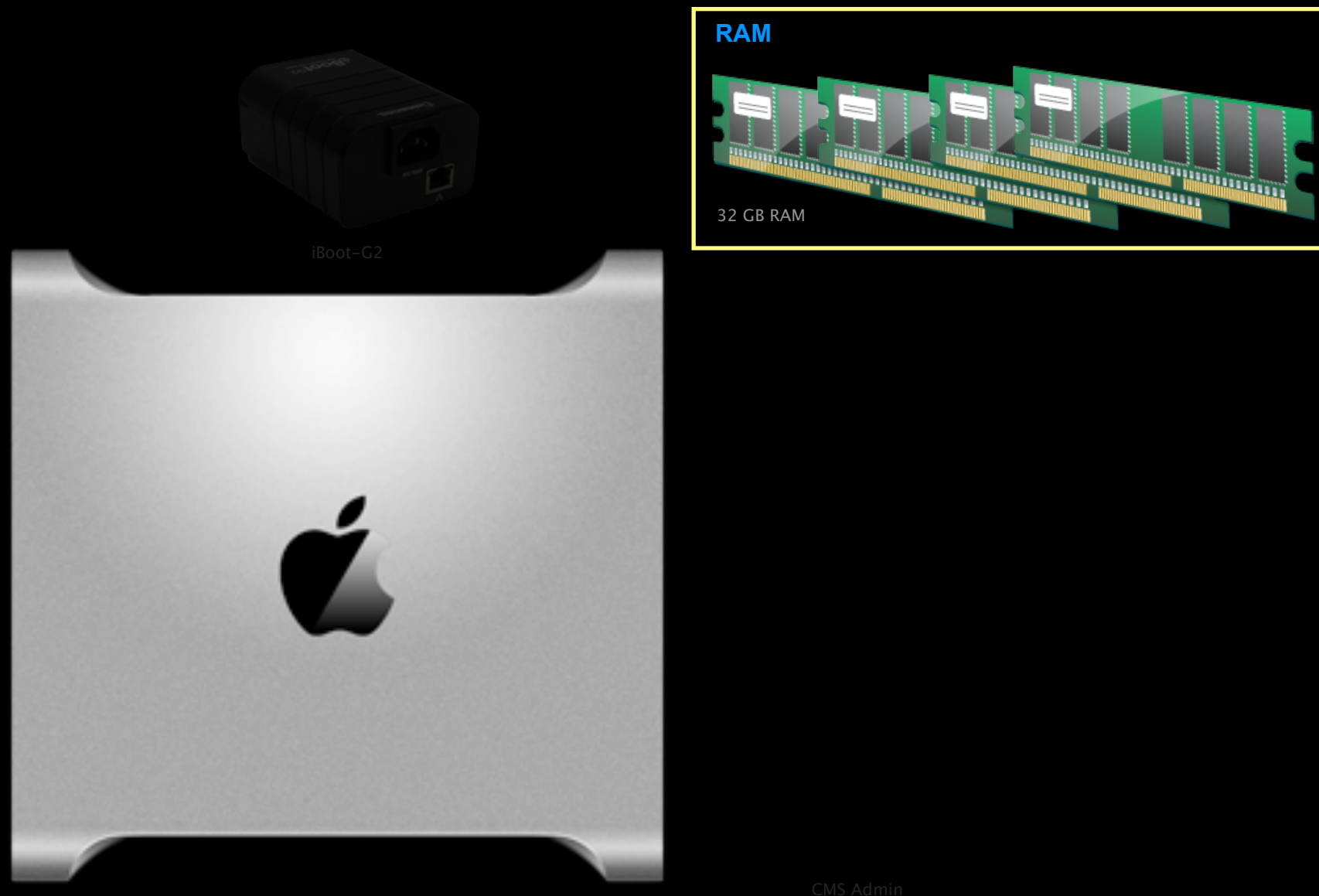
J. Willard Marriott Library
THE UNIVERSITY OF UTAH

Machine Setup



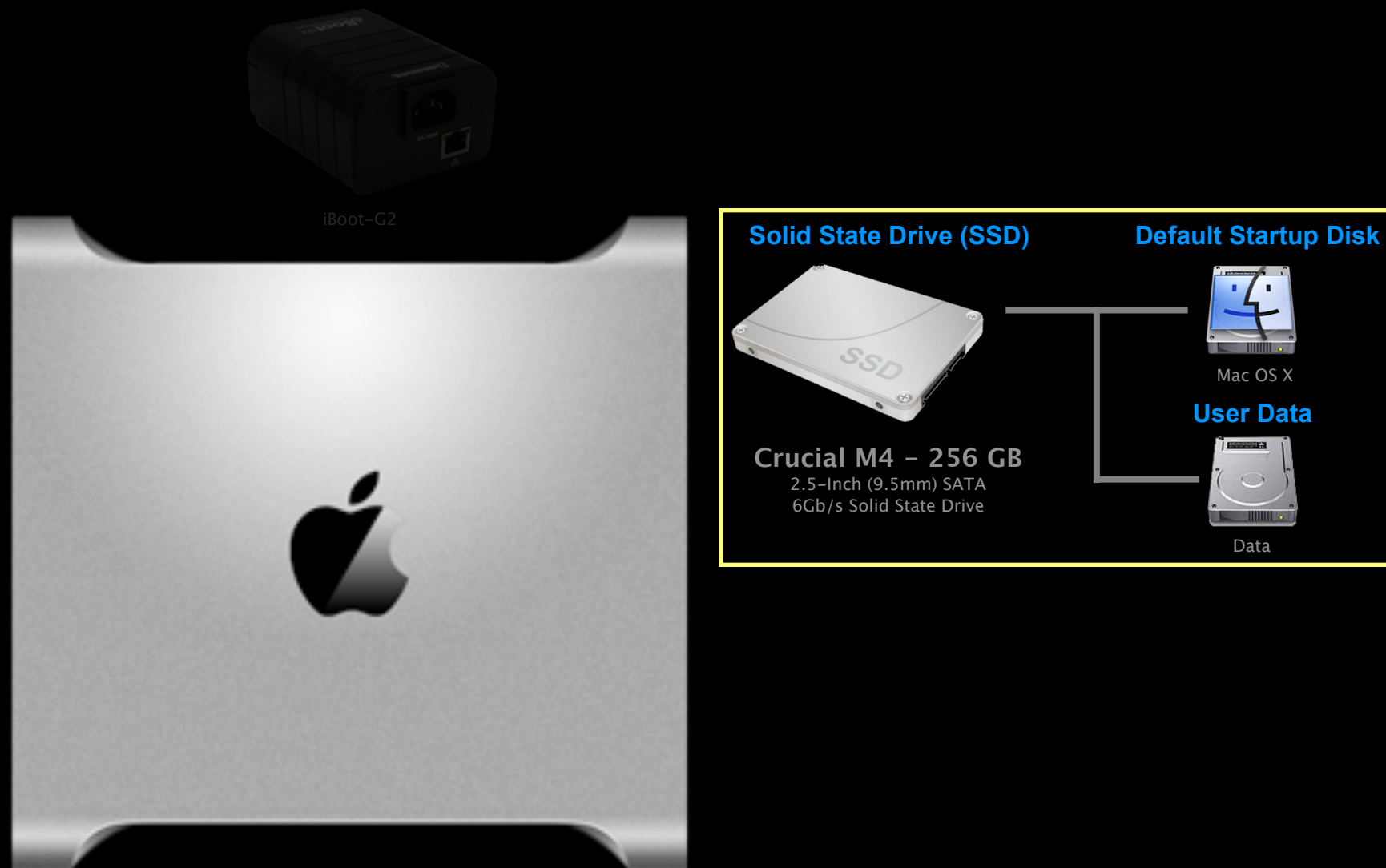
Machine Setup

Terminal Server



Machine Setup

Terminal Server



Machine Setup

Terminal Server

Network Controlled Power Switch



iBoot-G2



iBoot-G2

Web Based Setup & Control

Attached to: Load Balancer

Power Status

ON

Power ON Power OFF Cycle Power 10 Seconds

Auto Ping

Status	Trigger Counter
1 OK	0
2 Inactive	

History - Last 5 Events

Outlet	Action	Source	User	Time-Date
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Show All Download Clear

iBoot-G2 v1.10.59

Event Scheduling - On/Off & Cycling AutoPing - Monitoring & Action

Attached to: Terminal Server #1

AutoPing Settings

	AutoPing 1	AutoPing 2
IP Address:	XXX.XXX.XXX.XXX	
Frequency:	900	10
Fail Count:	4	3
Mode:	Single	
Action:	Cycle	Cycle 1 Times
Wait:	2	

Save Reset Reboot

iBoot-G2 v1.10.59

<http://dataprobe.com/iboot-g2.php/>

Machine Setup

Terminal Server



Standard HD



CMS Admin

CMS Admin

- Modeled After Apple Recovery
- Minimal OS
- Built automatically built from OS baseload
- Not a disk image
- Managed by radmind

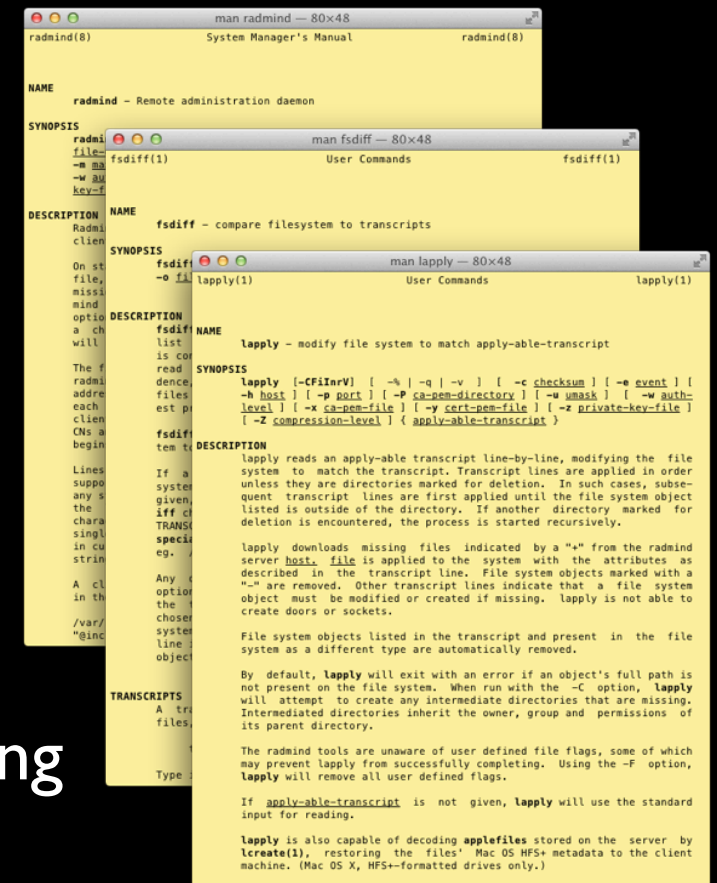
Used to quickly:

- Run radmind out-of context or update multiple volumes
- Run repair tools like Disk Utility & Diskwarrior
- Re-image default startup disk
- Used for major OS upgrades & troubleshooting



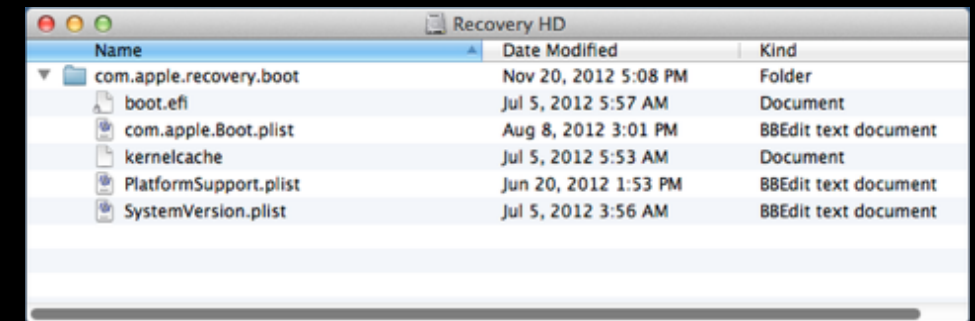
Custom Apple Recovery

- Modeled After Apple Recovery
 - Minimal OS
 - Built automatically from our OS baseload
 - Not a disk image
 - Managed by radmind
 - <http://www.radmind.org>
- Used to quickly:
 - Used for major OS upgrades & troubleshooting
 - Run radmind out-of context
 - Run hard disk repair/recovery tools like Diskwarrior
 - Re-image default startup disk



Custom Apple Recovery

- Recovery HD
 - Scanned “Recovery HD” file system



```
# fsdiff -c sha1 -I -K /dev/null “./Volumes/Recovery” HD > /os_x_10.8.3_recovery_hd_2013.05.08_rcg.T
```

```
d ./Volumes/Recovery\bHD                0775    0    0
d ./Volumes/Recovery\bHD/.fseventsd      0755    0    0
f ./Volumes/Recovery\bHD/.fseventsd/no_log 0644    0    0 1344459673    0 2jmj7l5rSw0yVb/vlWAYkK/YBwk=
f ./Volumes/Recovery\bHD/.metadata_never_index 0644    0    0 1344459673    0 2jmj7l5rSw0yVb/vlWAYkK/YBwk=
d ./Volumes/Recovery\bHD/.TemporaryItems 1777    0    0 AAAAAAAAAABAAAAAAAAAAAAAAAAAAAAAAAAAAAA=
d ./Volumes/Recovery\bHD/.TemporaryItems/folders.0 0700    0    0
d ./Volumes/Recovery\bHD/.TemporaryItems/folders.0/TemporaryItems 0755    0    0
d ./Volumes/Recovery\bHD/.Trashes        1333    0    0 AAAAAAAAAABAAAAAAAAAAAAAAAAAAAAAAAAAAAA=
d ./Volumes/Recovery\bHD/.Trashes/501    0700   501   20 AAAAAAAAAABAAAAAAAAAAAAAAAAAAAAAAAAAAAA=
d ./Volumes/Recovery\bHD/com.apple.recovery.boot 0755    0    0
a ./Volumes/Recovery\bHD/com.apple.recovery.boot/.disk_label 0644    0    0 1353456513    903 FRg7wIw03VI4ba+dyKU4EJBaIlg=
a ./Volumes/Recovery\bHD/com.apple.recovery.boot/.disk_label_2x 0644    0    0 1353456513   3339 hj2nnIIldcInpck4LUhHdXRR68=
a ./Volumes/Recovery\bHD/com.apple.recovery.boot/BaseSystem.chunklist 0644    0    80 1341490797   1934 zYB9tbNIXEC3Fboi9UVNBa0eEfa=
a ./Volumes/Recovery\bHD/com.apple.recovery.boot/BaseSystem.dmg 0644    0    80 1341489532 448703086 Sm4nwYhzNUCRPwaggZc3k9xGiI8=
f ./Volumes/Recovery\bHD/com.apple.recovery.boot/boot.efi 0644    0    0 1341489447 986272 0PAJYrfx5qR8xvwCH6YosqzV8o0=
f ./Volumes/Recovery\bHD/com.apple.recovery.boot/com.apple.Boot.plist 0644    0    0 1344459688   361 Sk+MLl3m6wFxbMbtPdsAht0xN8=
f ./Volumes/Recovery\bHD/com.apple.recovery.boot/kernelcache 0644    0    0 1341489236 14510577 7Lqsx023bnvLDh2JUMqqGJMM5L8=
f ./Volumes/Recovery\bHD/com.apple.recovery.boot/PlatformSupport.plist 0644    0    0 1340221980   3418 GKDcGGLk3Um7waN/YQ1NuRx3k1M=
f ./Volumes/Recovery\bHD/com.apple.recovery.boot/SystemVersion.plist 0444    0    0 1341482205   475 4j0Z02Q42oyBIm7NGGZtgYb54qY=
```

Custom Apple Recovery

- com.apple.Boot.plist allows booting from disk image

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Kernel Cache</key>
  <string>\com.apple.recovery.boot\kernelcache</string>
  <key>Kernel Flags</key>
  <string>rp=file:///com.apple.recovery.boot/BaseSystem.dmg</string>
</dict>
</plist>
```

- Mounted BaseSystem.dmg

hdiutil attach "/Volumes/Recovery HD/com.apple.recovery.boot/BaseSystem.dmg"

- Scanned "Mac OS X Base System"

- Mac OS X 10.8.3 > 46102 lines

- Used as model for our custom volume

Custom Apple Recovery

- Apple_Boot Partition Type
 - Prevents automatic mounting of volume
 - Visible via diskutil (CLI) as non-admin

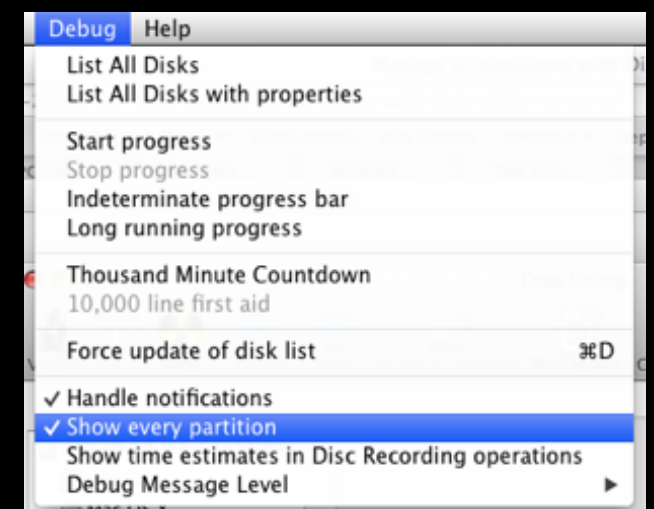
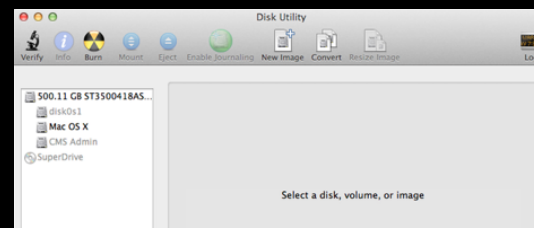
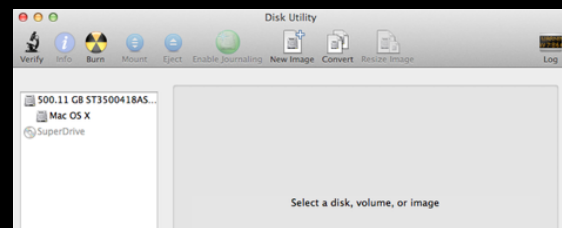
```
% diskutil list  
/dev/disk0
```

#:	TYPE	NAME	SIZE	IDENTIFIER
0:	GUID_partition_scheme		*256.1 GB	disk0
1:	EFI		209.7 MB	disk0s1
2:	Apple_HFS	Mac OS X	245.9 GB	disk0s2
3:	Apple_Boot	CMS Admin	9.7 GB	disk0s3

- Not visible to Disk Utility (GUI) by default
 - But, visible if you enable “Debug” menu

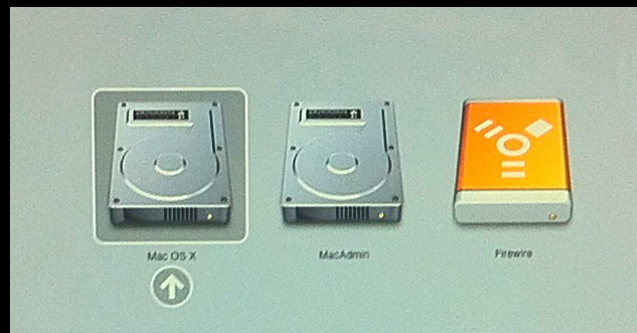
```
defaults write com.apple.DiskUtility DUDebugMenuEnabled 1
```

- Enable “Show every partition” option



Custom Apple Recovery

- Apple_Boot Partition Type
 - Not visible to “Startup Disk” unless volume mounted
 - But, visible at “Startup Manager” if mounted or not



- Mounting Volume - Apple_Boot

```
% diskutil mount <DISK_IDENTIFIER>
```

```
# Example...
```

```
% diskutil mount disk0s3
```

- Setting Type - Apple_Boot

```
% asr adjust --target <DEV_PATH> --settype Apple_Boot
```

```
# Example...
```

```
% asr adjust --target /dev/disk0s3 --settype Apple_Boot
```



Terminal Server Software

Aqua Connect Software Overview



Aqua Connect Remote Desktop Services



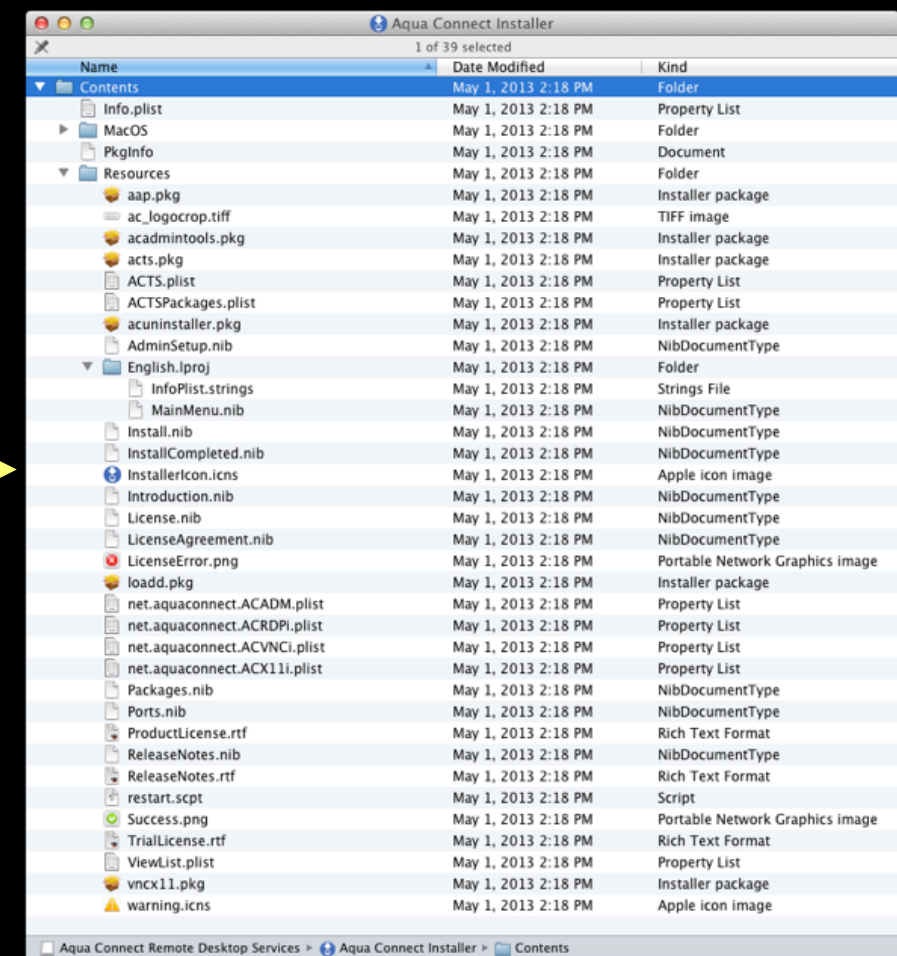
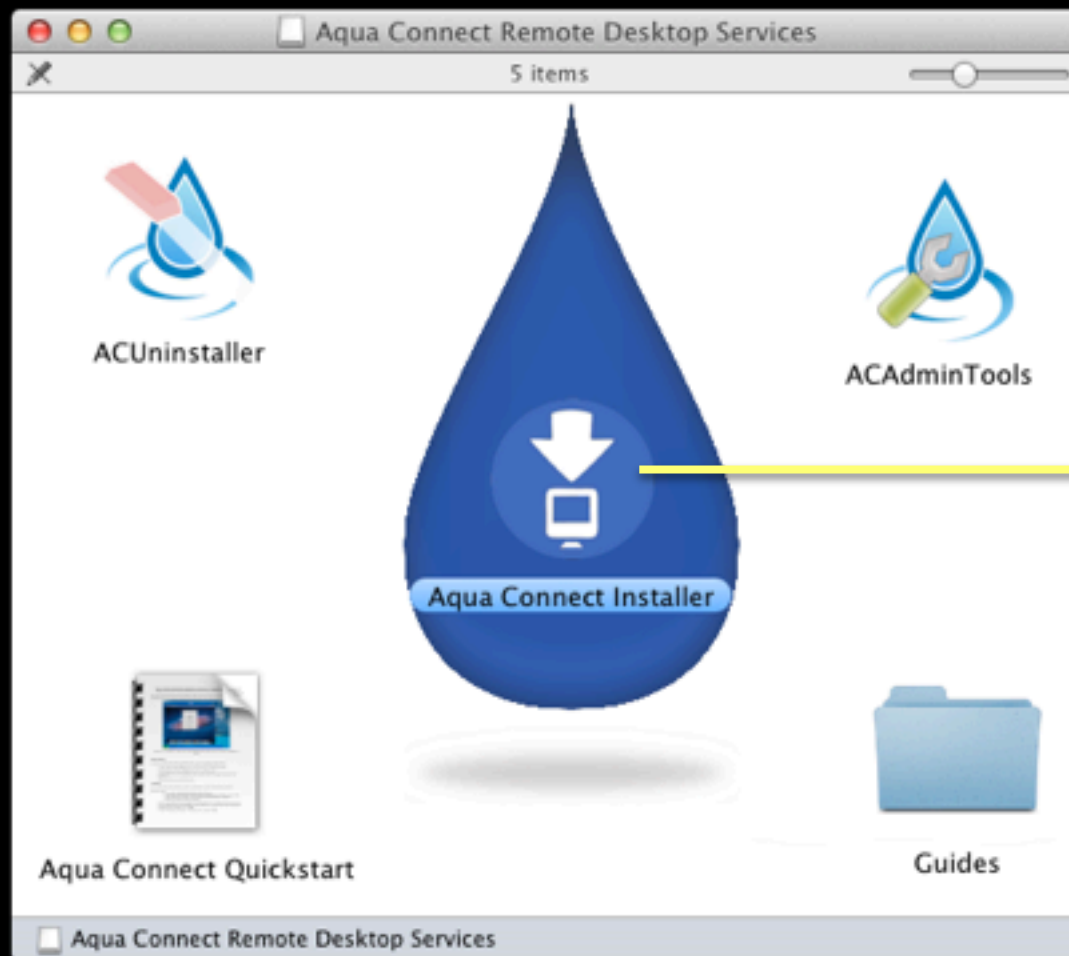
Aqua Connect Remote Desktop Services (ACRDS)

- Enables OS X Remote Access Emulation
- Supports Protocols:
 - X Window System (X11)
 - Remote Frame Buffer Protocol (VNC)
 - Remote Desktop Protocol (RDP)
 - Aqua Accelerated Protocol (AAP)
- Supported Directory Services:
 - Open Directory - Local & Network
 - Active Directory
 - LDAP



Aqua Connect Remote Desktop Services

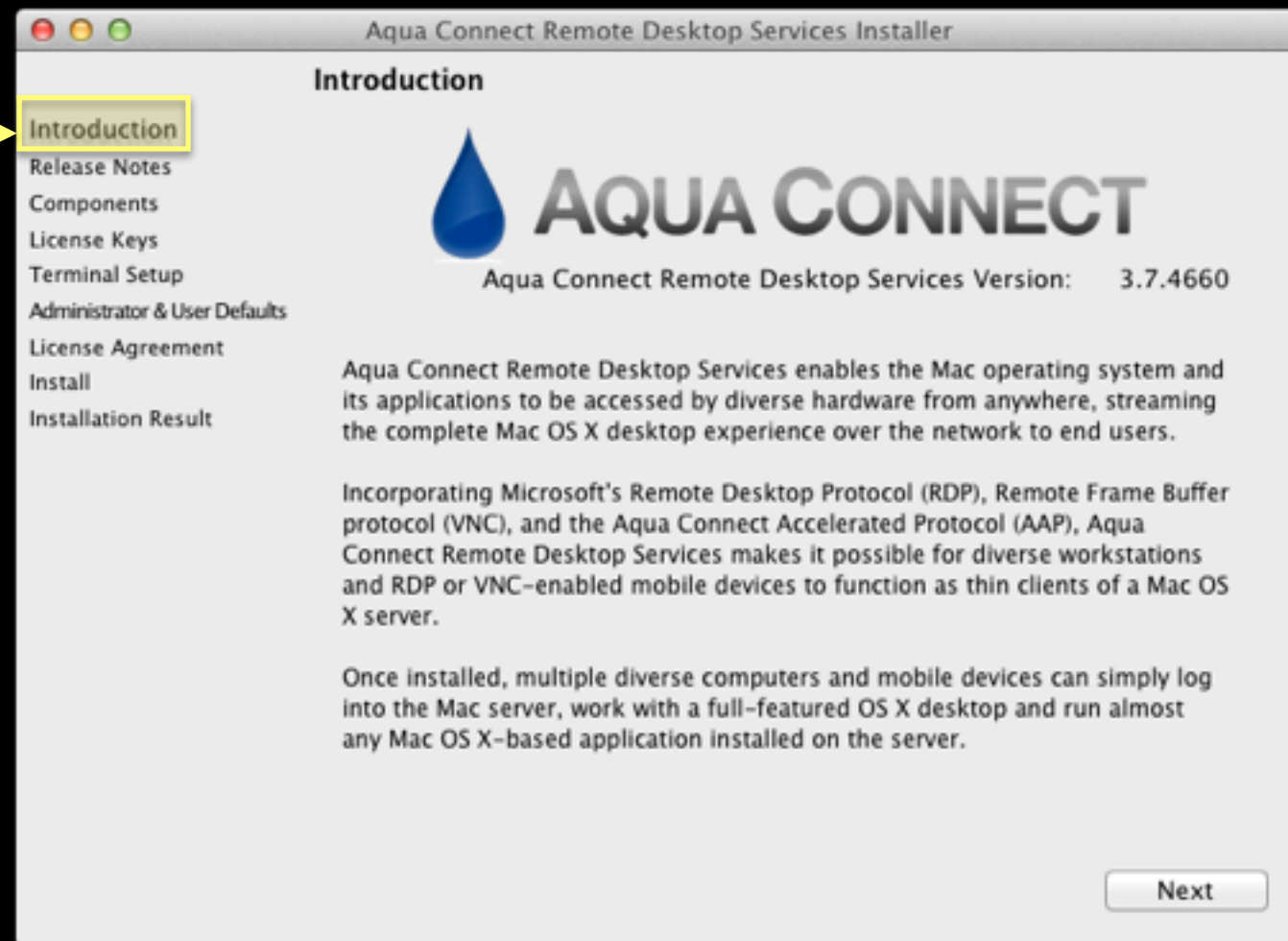
- Installation
 - Not package installer, but custom app w/packages installers



Aqua Connect Remote Desktop Services

- Installation

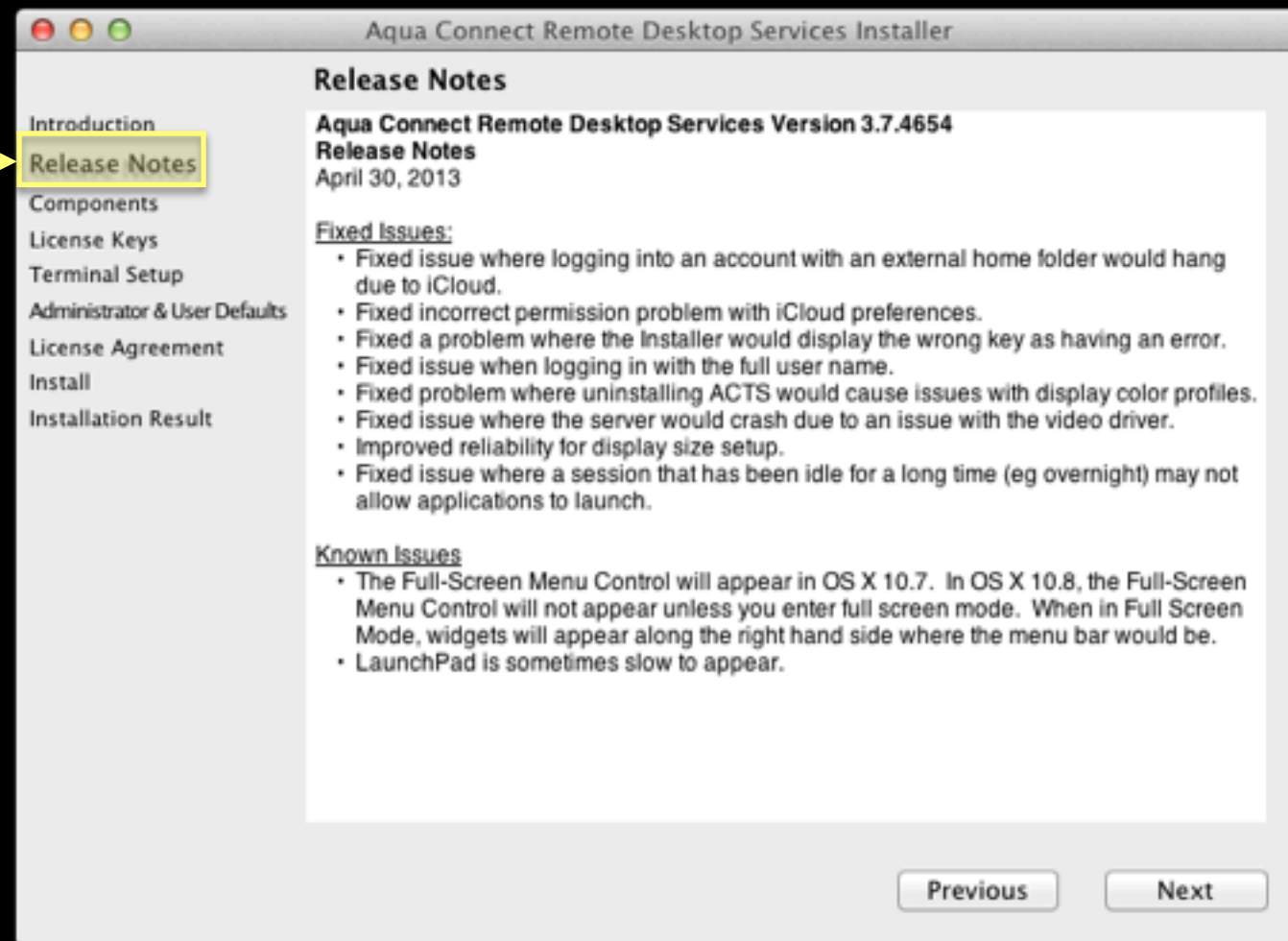
Welcome & Introduction



Aqua Connect Remote Desktop Services

- Installation

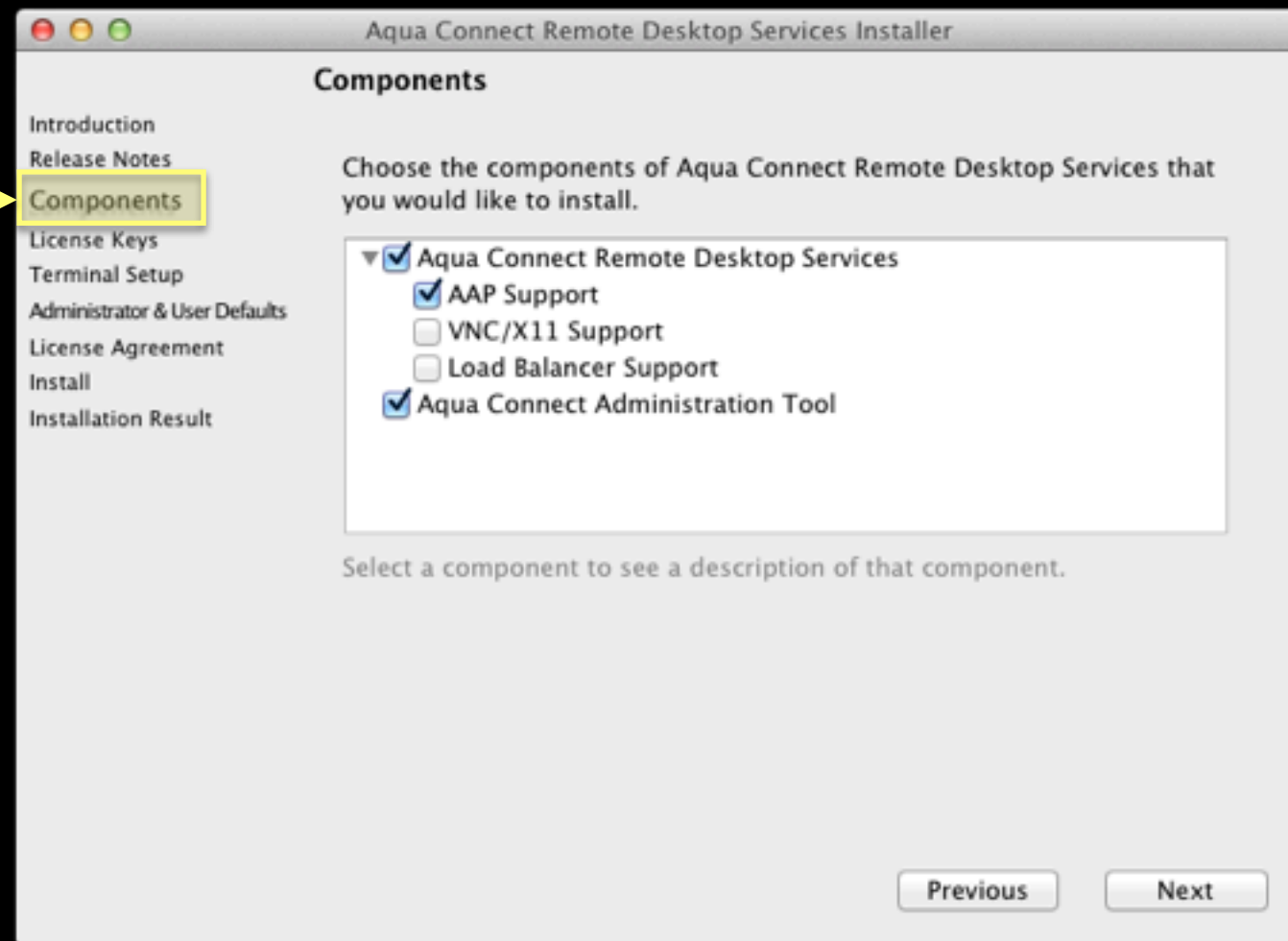
Release Notes



Aqua Connect Remote Desktop Services

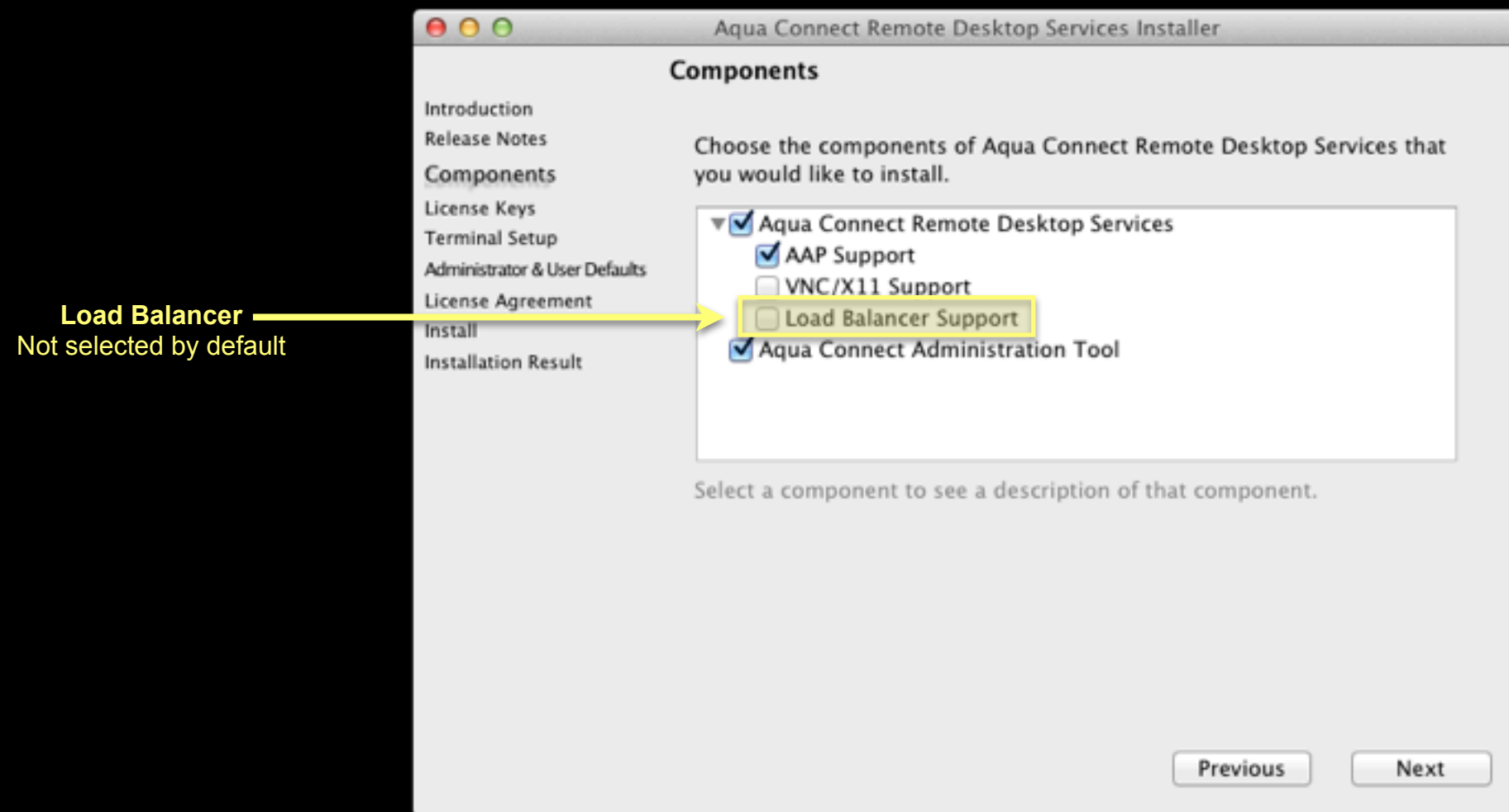
- Installation

Components



Aqua Connect Remote Desktop Services

- Installation



Aqua Connect Remote Desktop Services

- Installation

License Keys →

The screenshot shows the 'Aqua Connect Remote Desktop Services Installer' window. The 'License Keys' tab is selected in the left sidebar. The main area is titled 'License Keys' and contains the instruction 'Enter your key codes below.' Below this, there is a 'Region:' dropdown menu set to 'United States' and a text field containing 'licensing.aquaconnect.net'. A table with two columns, 'Key' and 'Client Count', is present. The 'Key' column has a text input field with the placeholder 'Enter your license key here'. At the bottom of the table are '+' and '-' buttons. At the bottom right of the window are 'Previous' and 'Next' buttons.

Key	Client Count
Enter your license key here	

Aqua Connect Remote Desktop Services

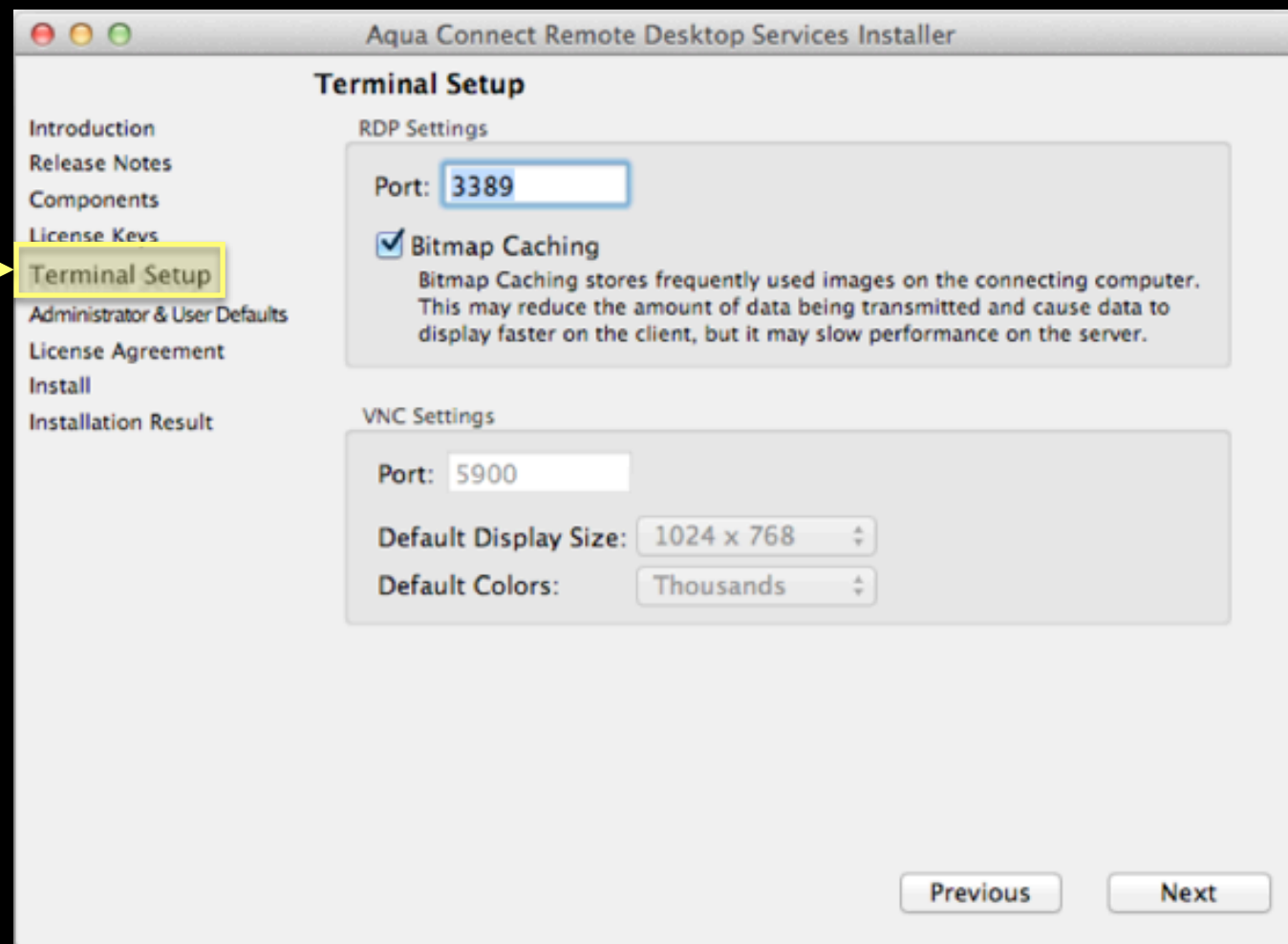
- Installation



Aqua Connect Remote Desktop Services

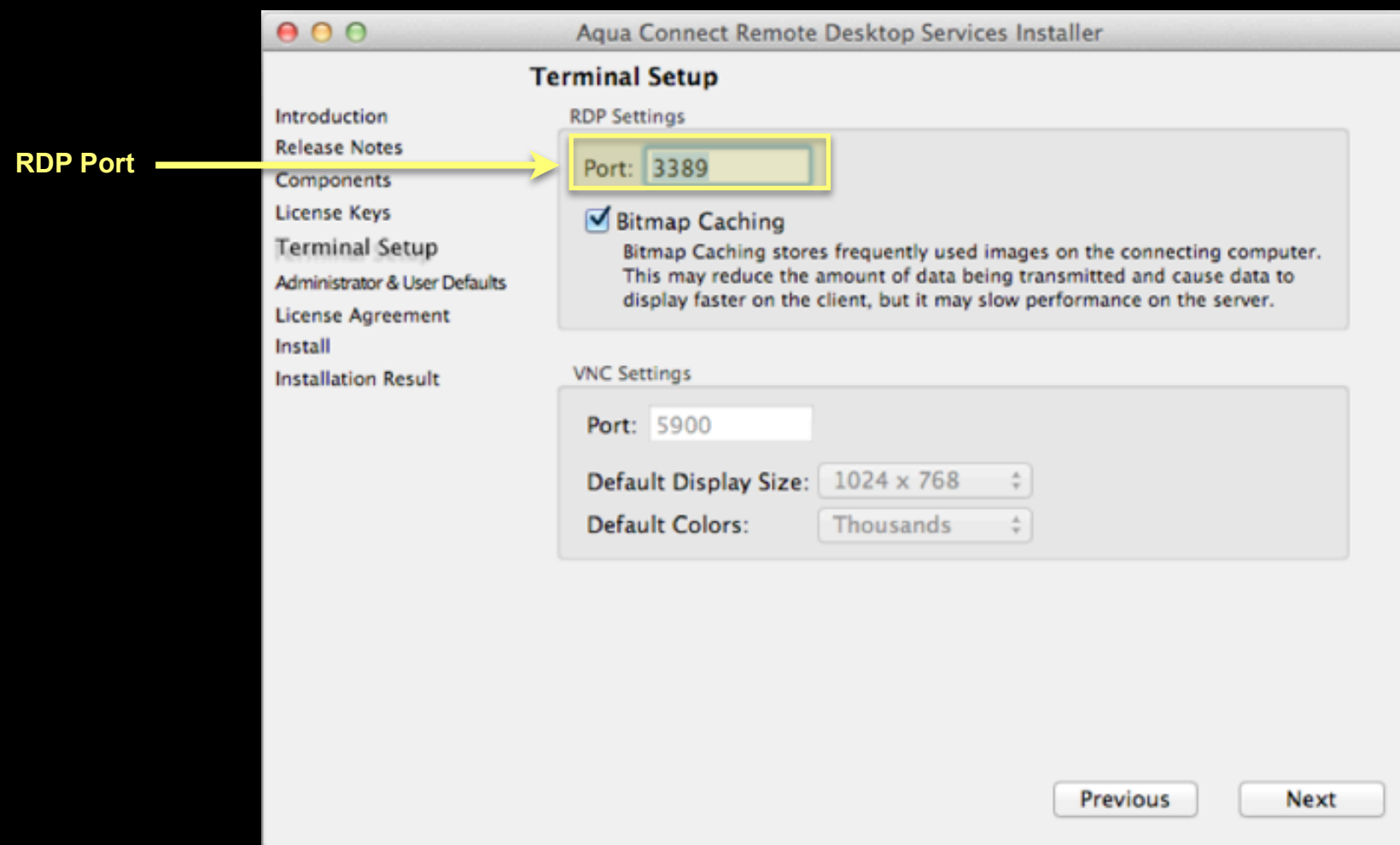
- Installation

Terminal Setup →



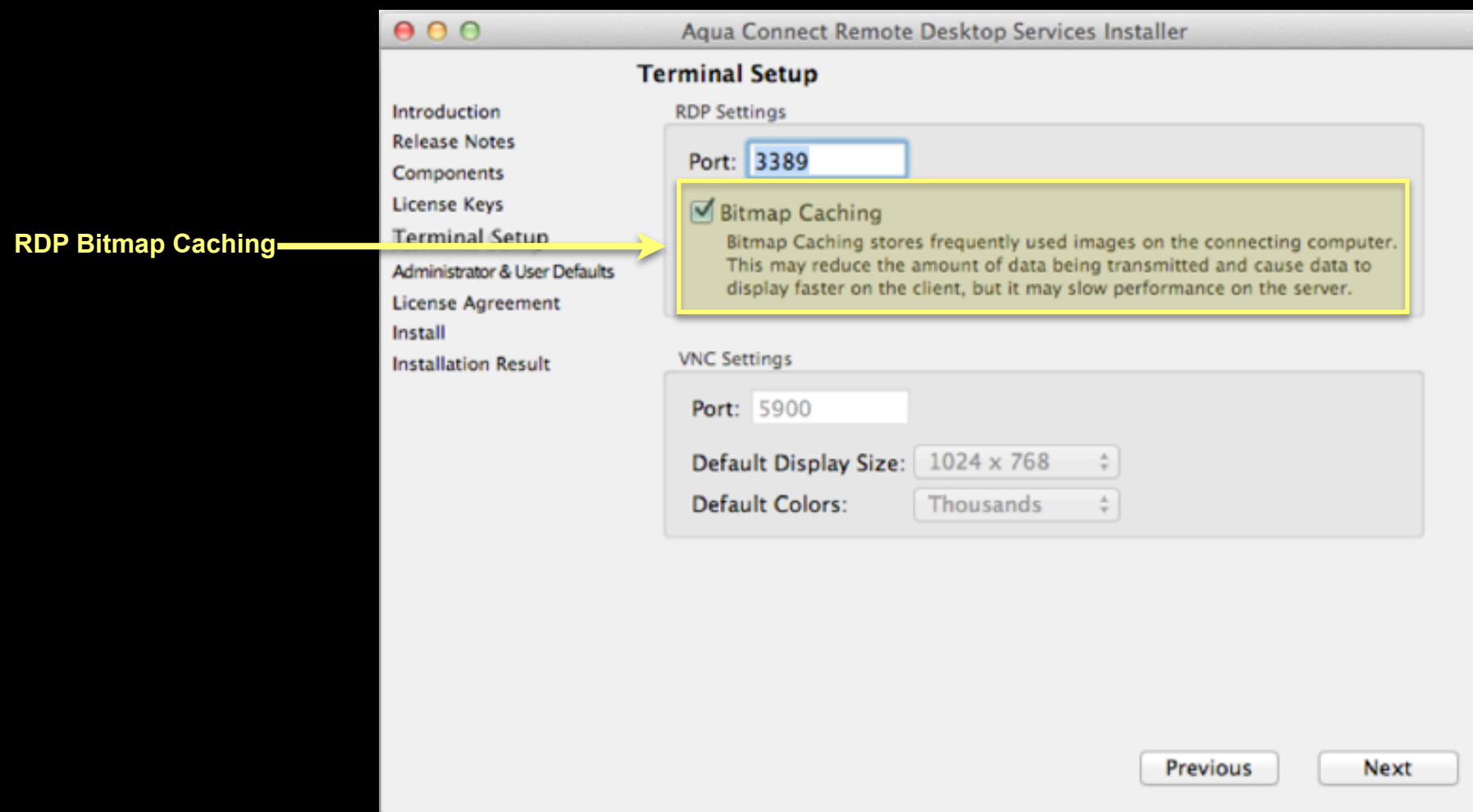
Aqua Connect Remote Desktop Services

- Installation



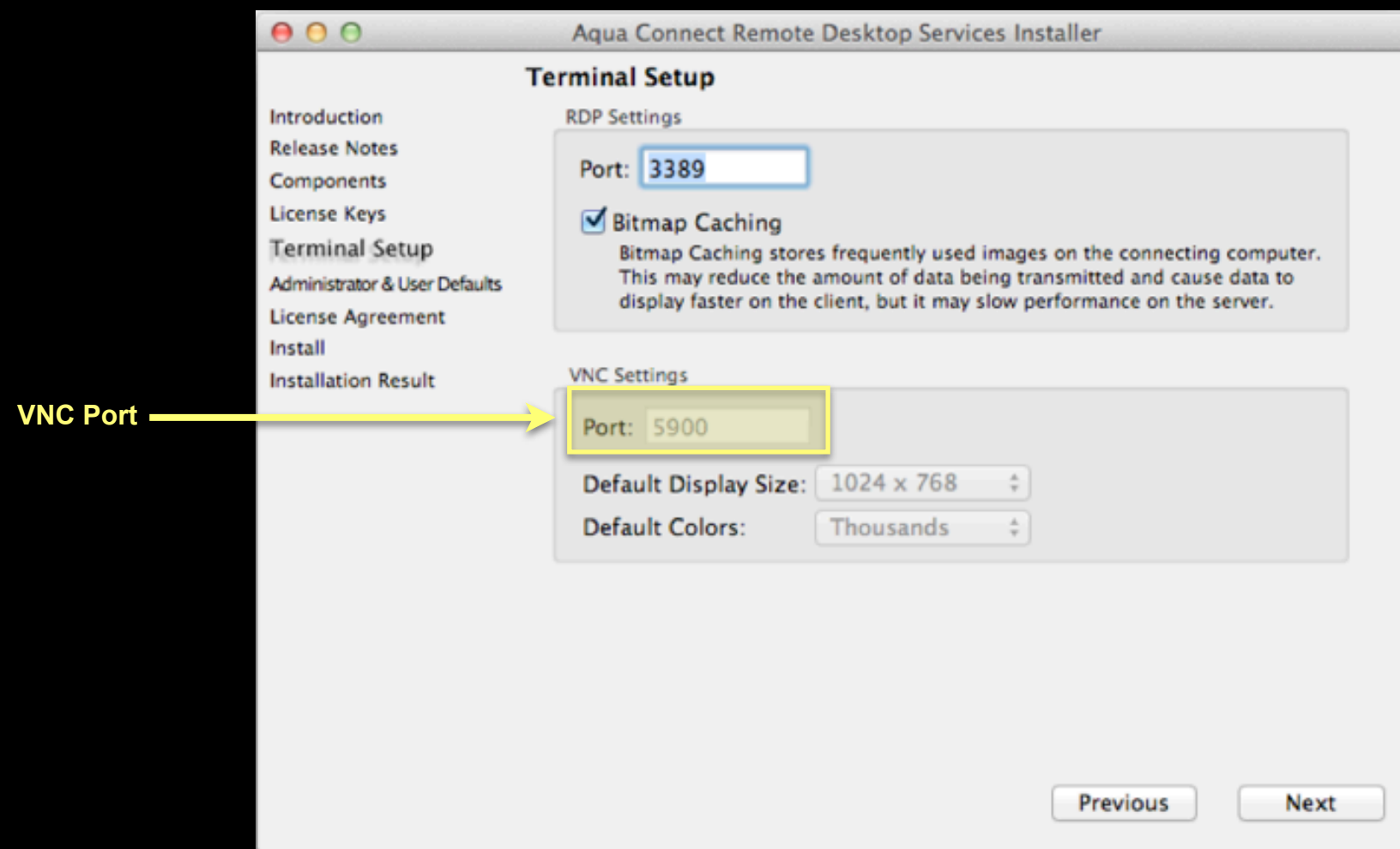
Aqua Connect Remote Desktop Services

- Installation



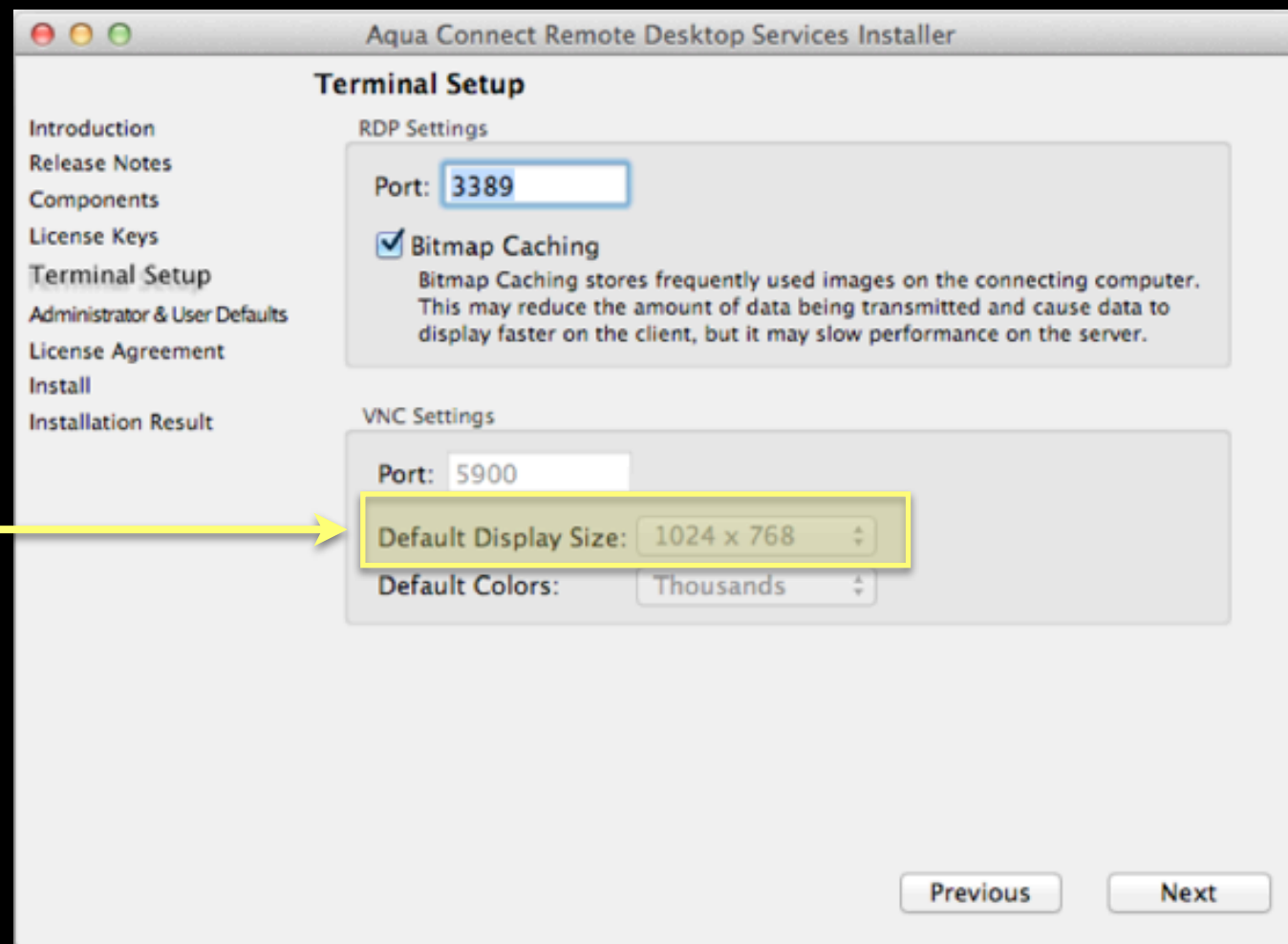
Aqua Connect Remote Desktop Services

- Installation



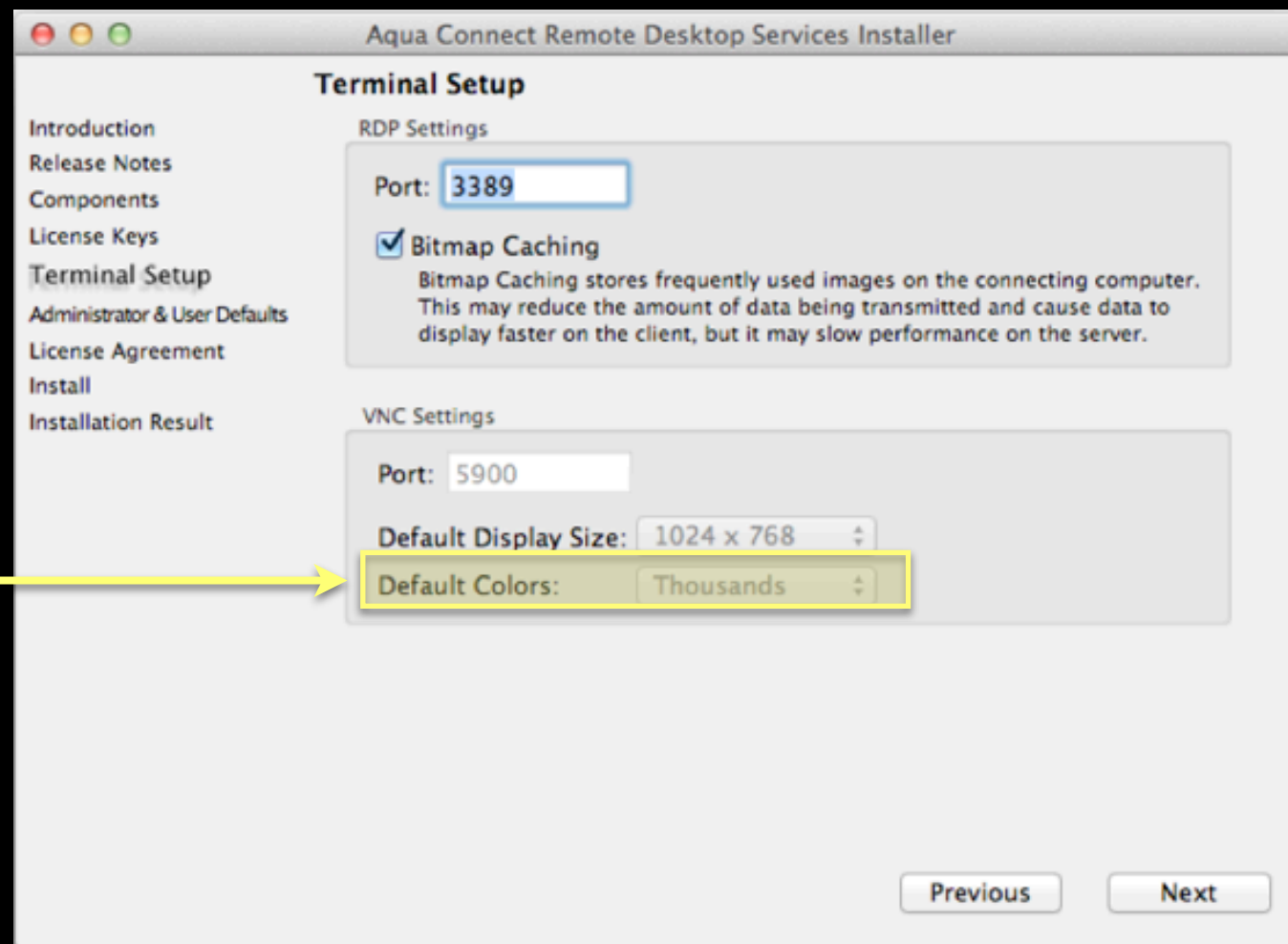
Aqua Connect Remote Desktop Services

- Installation



Aqua Connect Remote Desktop Services

- Installation



VNC Default Display Bit-Depth

Aqua Connect Remote Desktop Services

- Installation

Administrator & User Defaults →

The screenshot shows the 'Aqua Connect Remote Desktop Services Installer' window. The left sidebar contains a list of steps: Introduction, Release Notes, Components, License Keys, Terminal Setup, Administrator & User Defaults (highlighted with a yellow box), License Agreement, Install, and Installation Result. The main content area is titled 'Administrator & User Defaults' and contains the following text: 'Create an Aqua Connect Admin Tools account. Aqua Connect Admin Tools are used to manage users and sessions in Aqua Connect Remote Desktop Services.' Below this, there are input fields for 'Account Name' (containing 'acadmin'), 'Password' (masked with dots), and 'Reenter Password' (masked with dots). There is also an 'Admin Tools Port' field containing '616'. A section titled 'Specify the default capabilities for user accounts. These will apply to all users unless you explicitly change them for a user.' contains four checkboxes: 'User is Enabled' (checked), 'Allow information to be transferred via the clipboard' (checked), 'Allow printing on a printer connected to the client computer' (checked), and 'Terminate user's session when they disconnect from the server.' (unchecked). At the bottom right, there are 'Previous' and 'Next' buttons.

Aqua Connect Remote Desktop Services

- Installation

Aqua Connect Admin Tool
Admin Username

Aqua Connect Remote Desktop Services Installer

Administrator & User Defaults

Create an Aqua Connect Admin Tools account. Aqua Connect Admin Tools are used to manage users and sessions in Aqua Connect Remote Desktop Services.

Account Name:

Password: Reenter Password:

Admin Tools Port:

Specify the default capabilities for user accounts. These will apply to all users unless you explicitly change them for a user.

☒ User is Enabled

☒ Allow information to be transferred via the clipboard

☒ Allow printing on a printer connected to the client computer

☐ Terminate user's session when they disconnect from the server.

Previous Next

Aqua Connect Remote Desktop Services

- Installation

Aqua Connect Admin Tool
Admin Password

Aqua Connect Remote Desktop Services Installer

Administrator & User Defaults

Create an Aqua Connect Admin Tools account. Aqua Connect Admin Tools are used to manage users and sessions in Aqua Connect Remote Desktop Services.

Account Name:

Password: Reenter Password:

Admin Tools Port:

Specify the default capabilities for user accounts. These will apply to all users unless you explicitly change them for a user.

☒ User is Enabled

☒ Allow information to be transferred via the clipboard

☒ Allow printing on a printer connected to the client computer

☐ Terminate user's session when they disconnect from the server.

Previous Next

Aqua Connect Remote Desktop Services

- Installation

Aqua Connect Admin Tool
Port

The screenshot shows the 'Aqua Connect Remote Desktop Services Installer' window. The 'Administrator & User Defaults' tab is selected in the left sidebar. The main content area shows the following fields and options:

- Account Name:** acadmin
- Password:** (masked with dots)
- Reenter Password:** (masked with dots)
- Admin Tools Port:** 616 (highlighted with a yellow box)

Below these fields, there is a section titled 'Specify the default capabilities for user accounts. These will apply to all users unless you explicitly change them for a user.' with the following checked options:

- ☒ User is Enabled
- ☒ Allow information to be transferred via the clipboard
- ☒ Allow printing on a printer connected to the client computer
- ☐ Terminate user's session when they disconnect from the server.

At the bottom right, there are 'Previous' and 'Next' buttons.

Aqua Connect Remote Desktop Services

- Installation

Default Settings for Users
Enable/Disable Users

Aqua Connect Remote Desktop Services Installer

Administrator & User Defaults

Create an Aqua Connect Admin Tools account. Aqua Connect Admin Tools are used to manage users and sessions in Aqua Connect Remote Desktop Services.

Account Name:

Password: Reenter Password:

Admin Tools Port:

Specify the default capabilities for user accounts. These will apply to all users unless you explicitly change them for a user.

☒ User is Enabled

☒ Allow information to be transferred via the clipboard

☒ Allow printing on a printer connected to the client computer

☐ Terminate user's session when they disconnect from the server.

Previous Next

Aqua Connect Remote Desktop Services

- Installation

Aqua Connect Remote Desktop Services Installer

Administrator & User Defaults

Create an Aqua Connect Admin Tools account. Aqua Connect Admin Tools are used to manage users and sessions in Aqua Connect Remote Desktop Services.

Account Name:

Password: Reenter Password:

Admin Tools Port:

Specify the default capabilities for user accounts. These will apply to all users unless you explicitly change them for a user.

☒ User is Enabled

☒ Allow information to be transferred via the clipboard

☒ Allow printing on a printer connected to the client computer

☐ Terminate user's session when they disconnect from the server.

Previous Next

Default Settings for Users
Enable/Disable Local Clipboard

Aqua Connect Remote Desktop Services

- Installation

Aqua Connect Remote Desktop Services Installer

Administrator & User Defaults

Create an Aqua Connect Admin Tools account. Aqua Connect Admin Tools are used to manage users and sessions in Aqua Connect Remote Desktop Services.

Account Name:

Password: Reenter Password:

Admin Tools Port:

Specify the default capabilities for user accounts. These will apply to all users unless you explicitly change them for a user.

- ☒ User is Enabled
- ☒ Allow information to be transferred via the clipboard
- ☒ Allow printing on a printer connected to the client computer
- ☐ Terminate user's session when they disconnect from the server.

Previous Next

Default Settings for Users
Enable/Disable Local Printer

Aqua Connect Remote Desktop Services

- Installation

Aqua Connect Remote Desktop Services Installer

Administrator & User Defaults

Create an Aqua Connect Admin Tools account. Aqua Connect Admin Tools are used to manage users and sessions in Aqua Connect Remote Desktop Services.

Account Name:

Password: Reenter Password:

Admin Tools Port:

Specify the default capabilities for user accounts. These will apply to all users unless you explicitly change them for a user.

- ☒ User is Enabled
- ☒ Allow information to be transferred via the clipboard
- ☒ Allow printing on a printer connected to the client computer
- ☐ Terminate user's session when they disconnect from the server.

Previous Next

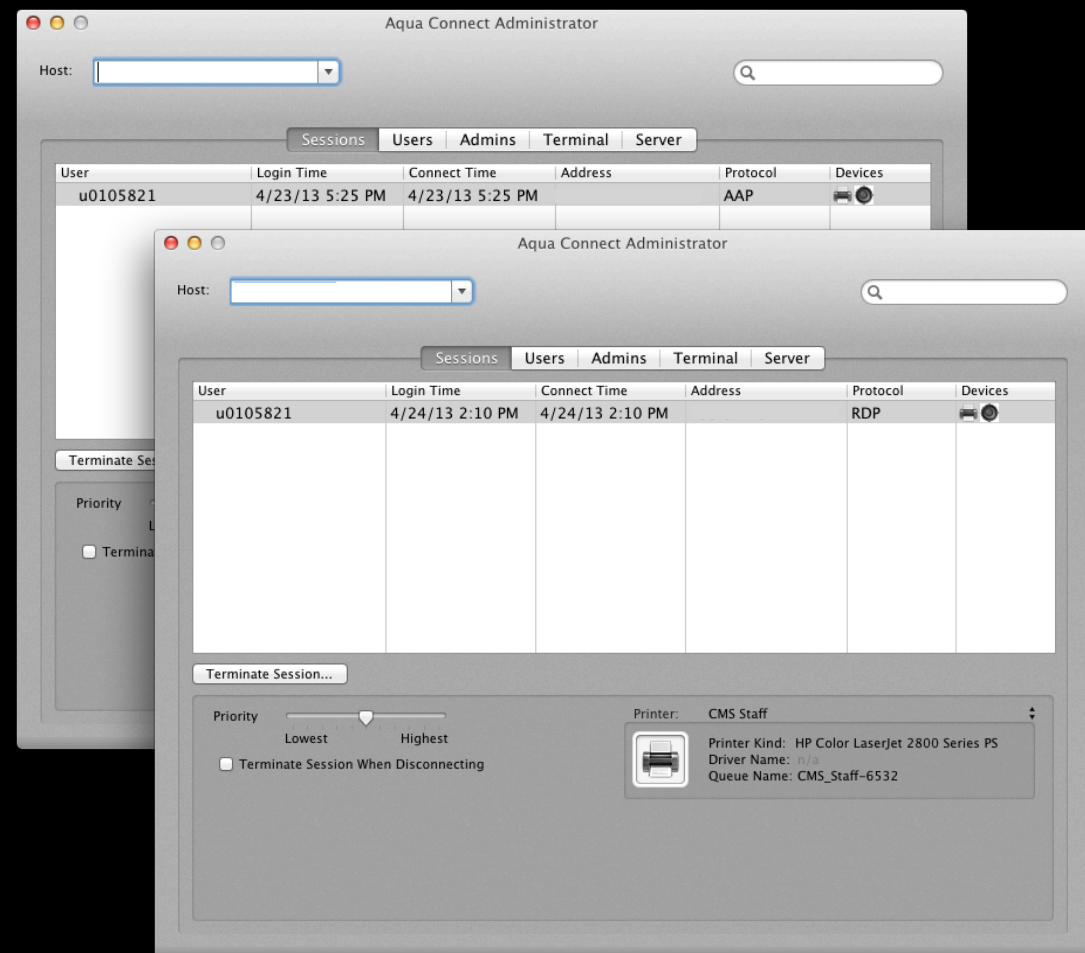
Default Settings for Users
Terminate Users Session When Disconnect

Aqua Connect Remote Desktop Services Administration Tool



Aqua Connect Remote Desktop Services Administration Tool

- Manages Various Aspects of ACRDS
 - Sessions
 - Users
 - User Audit Trails
 - ACAAdmin Tool Admins
 - Protocol Settings
 - Server Info
 - Group Filters

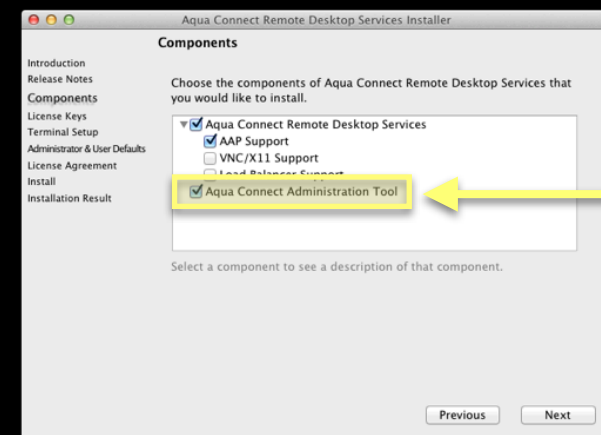
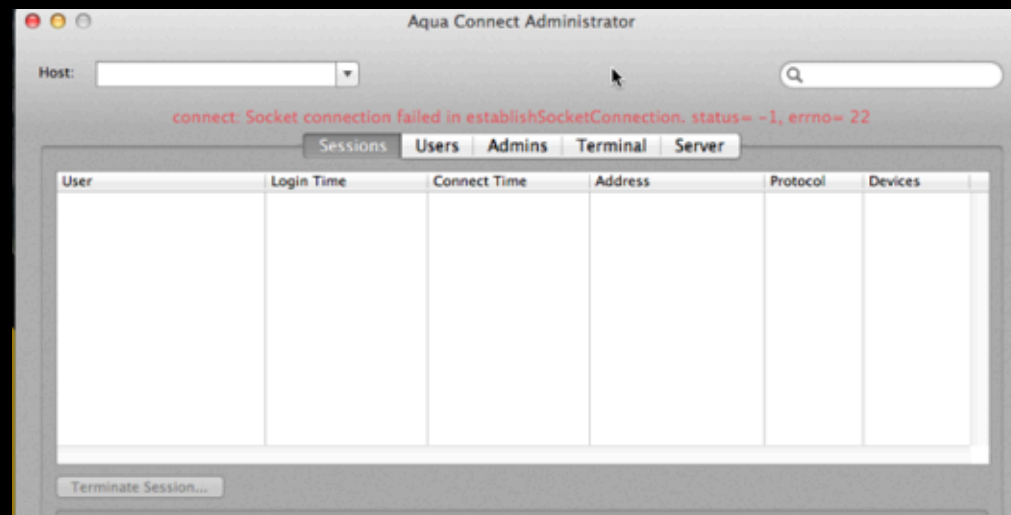


Aqua Connect Remote Desktop Services Administration Tool



Aqua Connect Remote Desktop Services Administration Tool

- Installation
 - Server Installation Default Location
`/Applications/Server/ACAdminTools.app`
 - Or drag-n-drop application
 - SSL key/certificate needs to be setup
 - Else, get error...



Aqua Connect Remote Desktop Services Administration Tool



Aqua Connect Remote Desktop Services Administration Tool

- Script for Generating Private Key & Certificate for SSL

```
# Create "Default.key" and "Default.crt" certificate for ACADM's SSL
```

```
if [ -e /etc/certificates/Default.crt ]; then
```

```
    echo "Not creating certificates."
```

```
else
```

```
    mkdir -p /etc/certificates
```

```
    # Generate an RSA Private Key
```

```
    openssl genrsa -out /tmp/Default.key
```

```
    # Generate Certificate using RSA Private Key
```

```
    openssl req -x509 -newkey rsa:512 -key /tmp/Default.key -out /tmp/Default.crt -subj "/"
```

```
    # Move into directory
```

```
    mv /tmp/Default.key /etc/certificates/Default.key
```

```
    mv /tmp/Default.crt /etc/certificates/Default.crt
```

```
fi
```



Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.179	RDP	
u0105821	4/24/13 4:54 PM				

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a

Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Username

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.179	RDP	
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a

Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Login Time
(When Session Was Started)

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.179	RDP	
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a



Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Connection Time
(When Client Connected to Session)

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.179	RDP	
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a



Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Protocol
(AAP, VNC, RDP or X11)

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.175	RDP	
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a



Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Devices
(Blank - No Devices)



Local Printer







Audio Enabled

Aqua Connect Administrator

Host:

Search:

Sessions Users Admins Terminal Server


User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	 
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.175	KDP	 
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

 Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a



Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Devices
(Blank - No Devices)



Local Printer







Audio Enabled

Aqua Connect Administrator

Host:

Search:

Sessions Users Admins Terminal Server


User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	 
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.175	KDP	 
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

 Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a

Local Printer

(Printer Model, Driver & Queue)



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Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Devices
(Blank - No Devices)



Local Printer







Audio Enabled

Aqua Connect Administrator

Host:

Search:

Sessions Users Admins Terminal Server


User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	 
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.175	KDP	 
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

 Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a

Local Printer
Click pop-up menu to display all local printers.



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Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Active Sessions

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.179	RDP	
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a

Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Idle Session →
(No connection time, address or protocol)

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.179	RDP	
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a



Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Priority
(Modifies Session CPU Time)
(Per Live Session)

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.179	RDP	
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a



Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	192.168.1.179	RDP	
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority: Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a

Terminate Session
(Immediately Terminate Client Session)

Warning

- User not notified of termination
- All data not saved is lost
- All programs terminated immediately



Aqua Connect Remote Desktop Services Administration Tool



Sessions - Monitor Live Sessions

Aqua Connect Administrator

Host:

Sessions Users Admins Terminal Server

User	Login Time	Connect Time	Address	Protocol	Devices
u0105821	4/23/13 5:25 PM	4/23/13 5:25 PM	192.168.1.149	AAP	
u0728242	4/24/13 4:48 PM	4/24/13 4:48 PM	155.97.17.66	RDP	
u0105821	4/24/13 4:54 PM				

Terminate Session...

Priority Lowest Highest

☐ Terminate Session When Disconnecting

Printer: u0105821's Printer

Printer Kind: AAP Printer
Driver Name: n/a
Queue Name: n/a

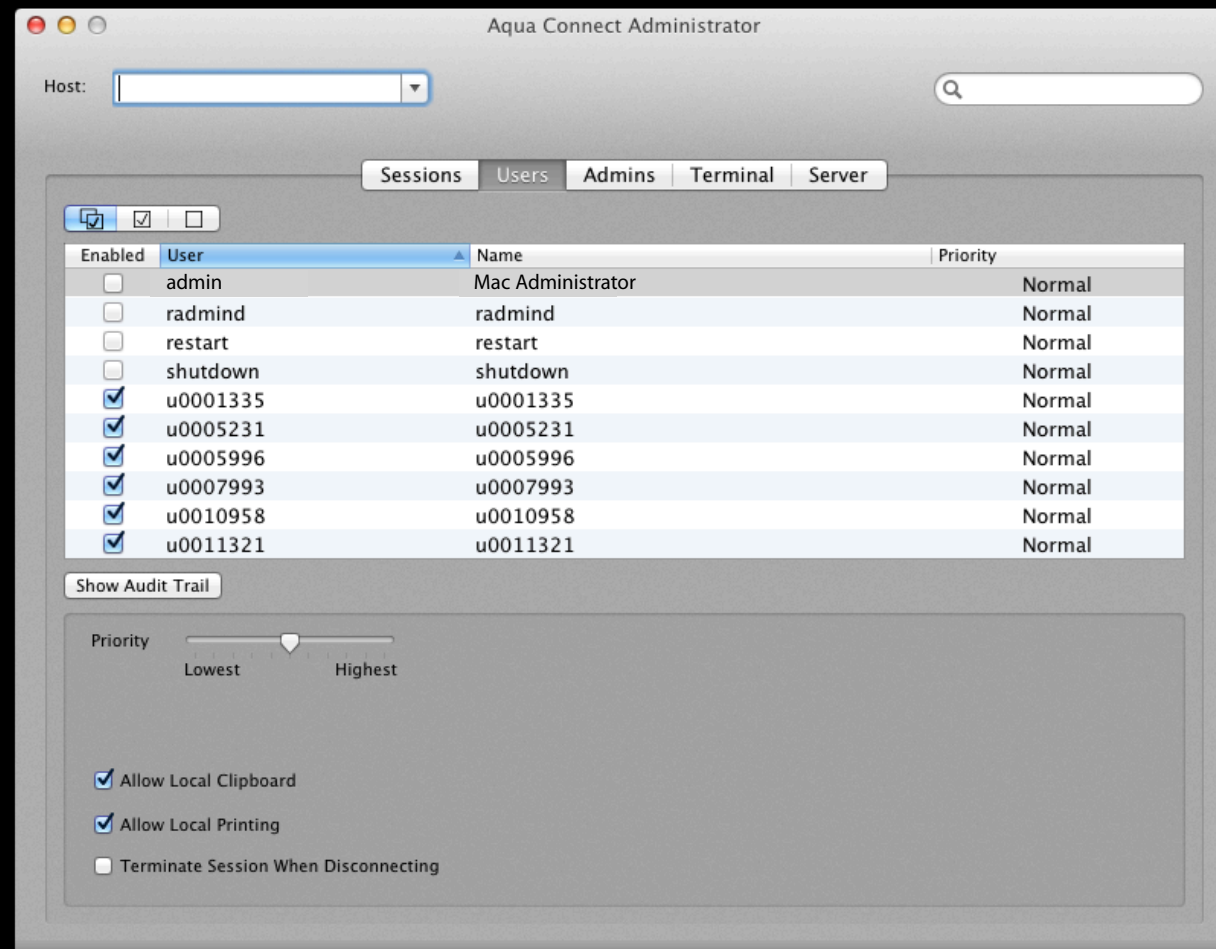
Terminate Session

(Terminate Session on Client Disconnecting)
(Per Live Session)



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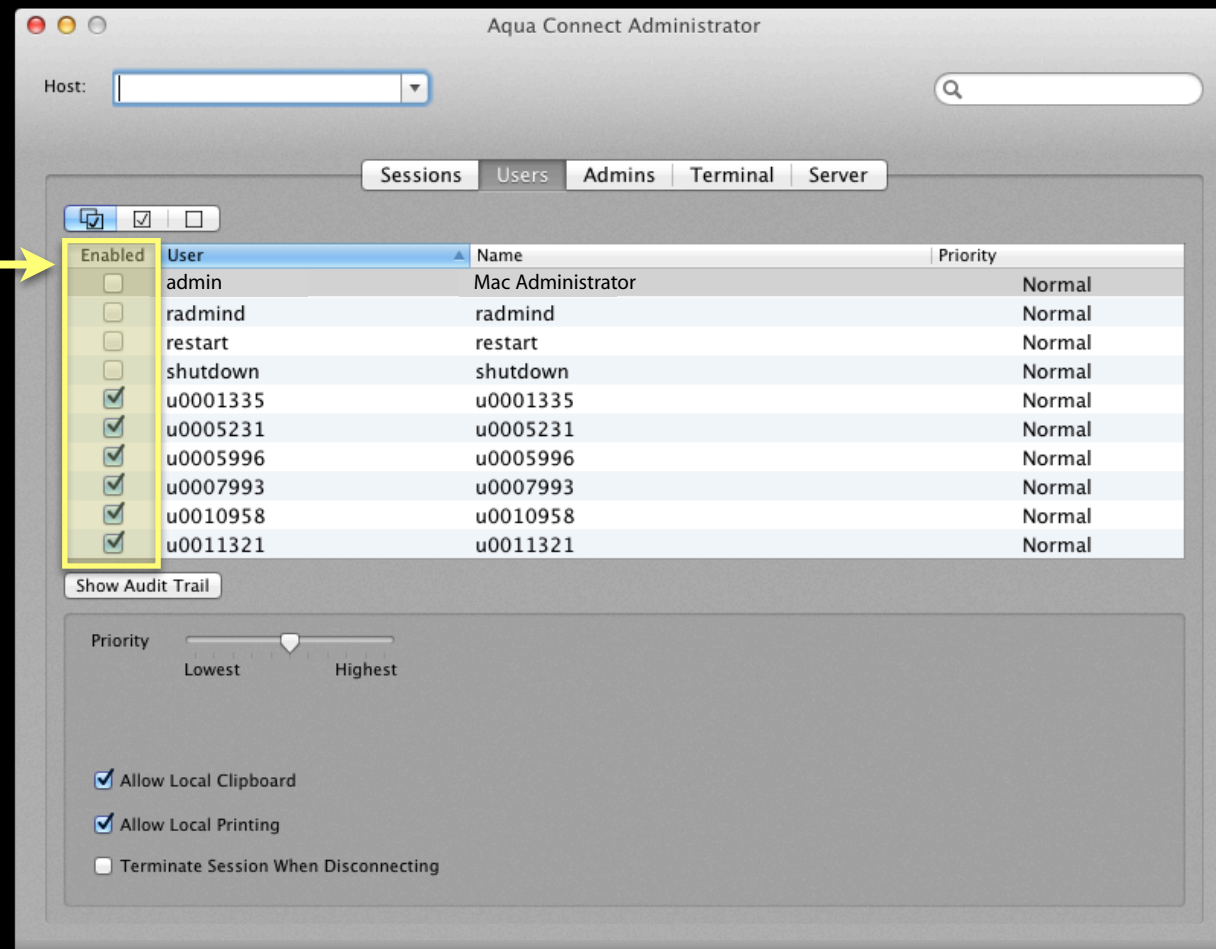
Aqua Connect Remote Desktop Services Administration Tool



Aqua Connect Remote Desktop Services Administration Tool



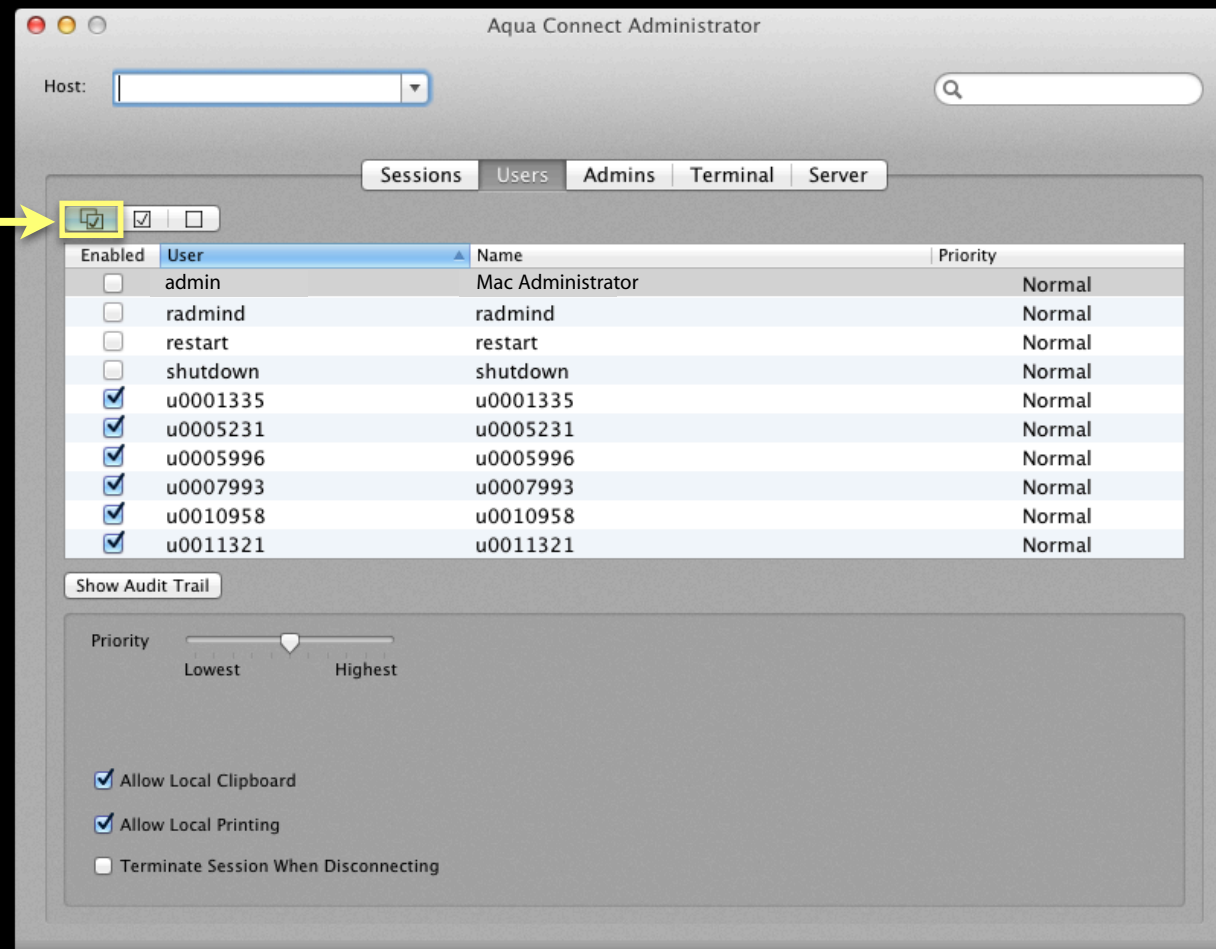
Enabled
User login access enabled or disabled



Aqua Connect Remote Desktop Services Administration Tool



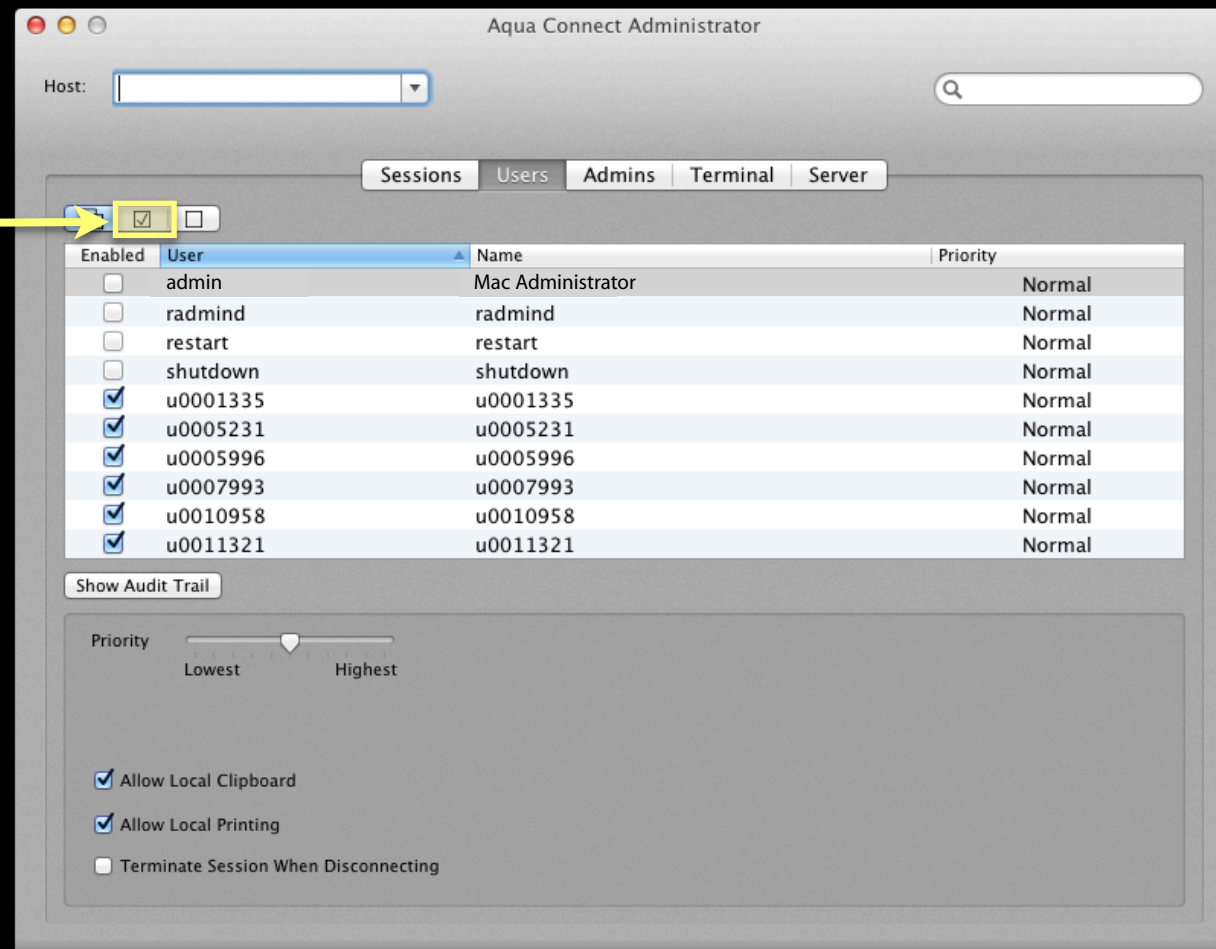
Show Enabled/Disabled
Show enabled/disabled users



Aqua Connect Remote Desktop Services Administration Tool



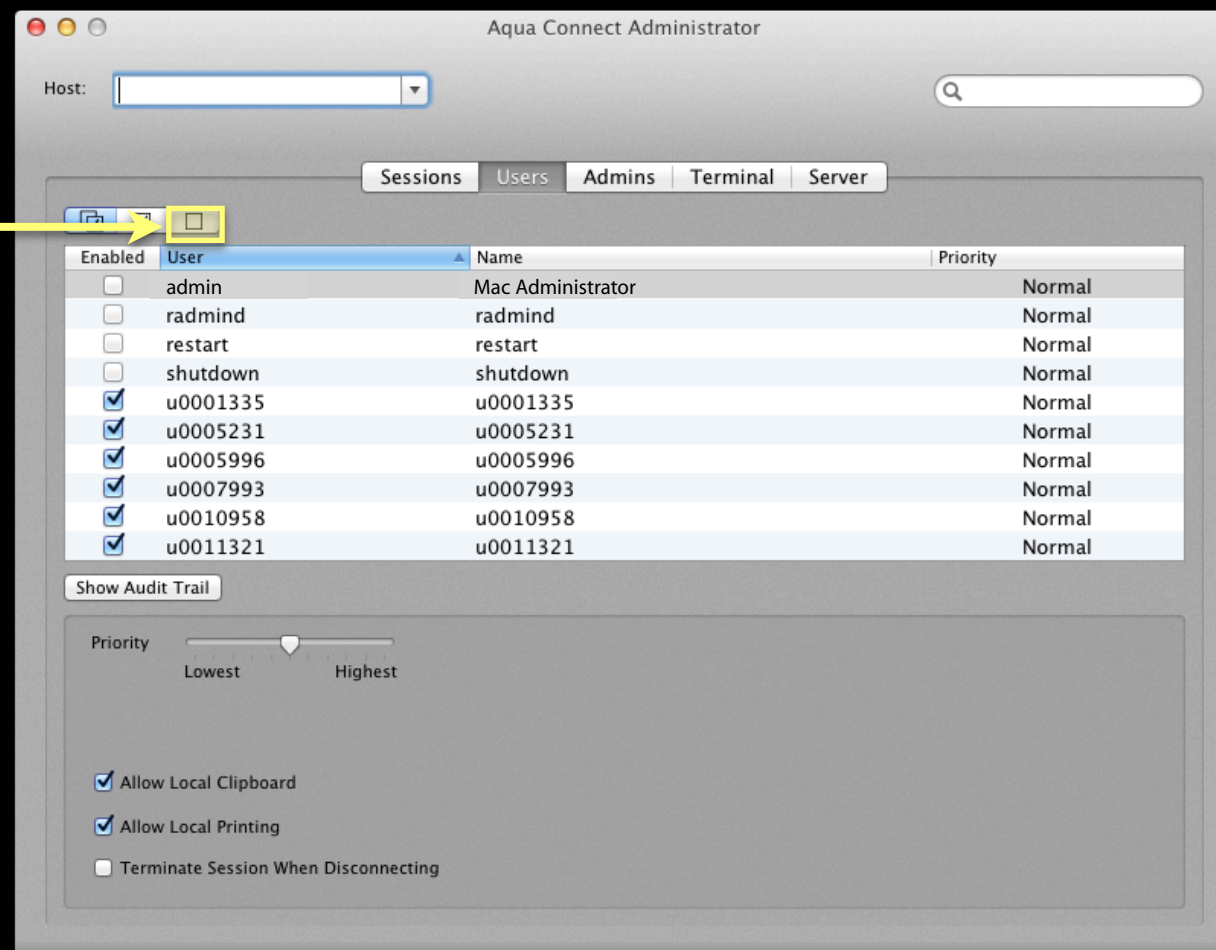
Show Enabled
Show enabled users only



Aqua Connect Remote Desktop Services Administration Tool



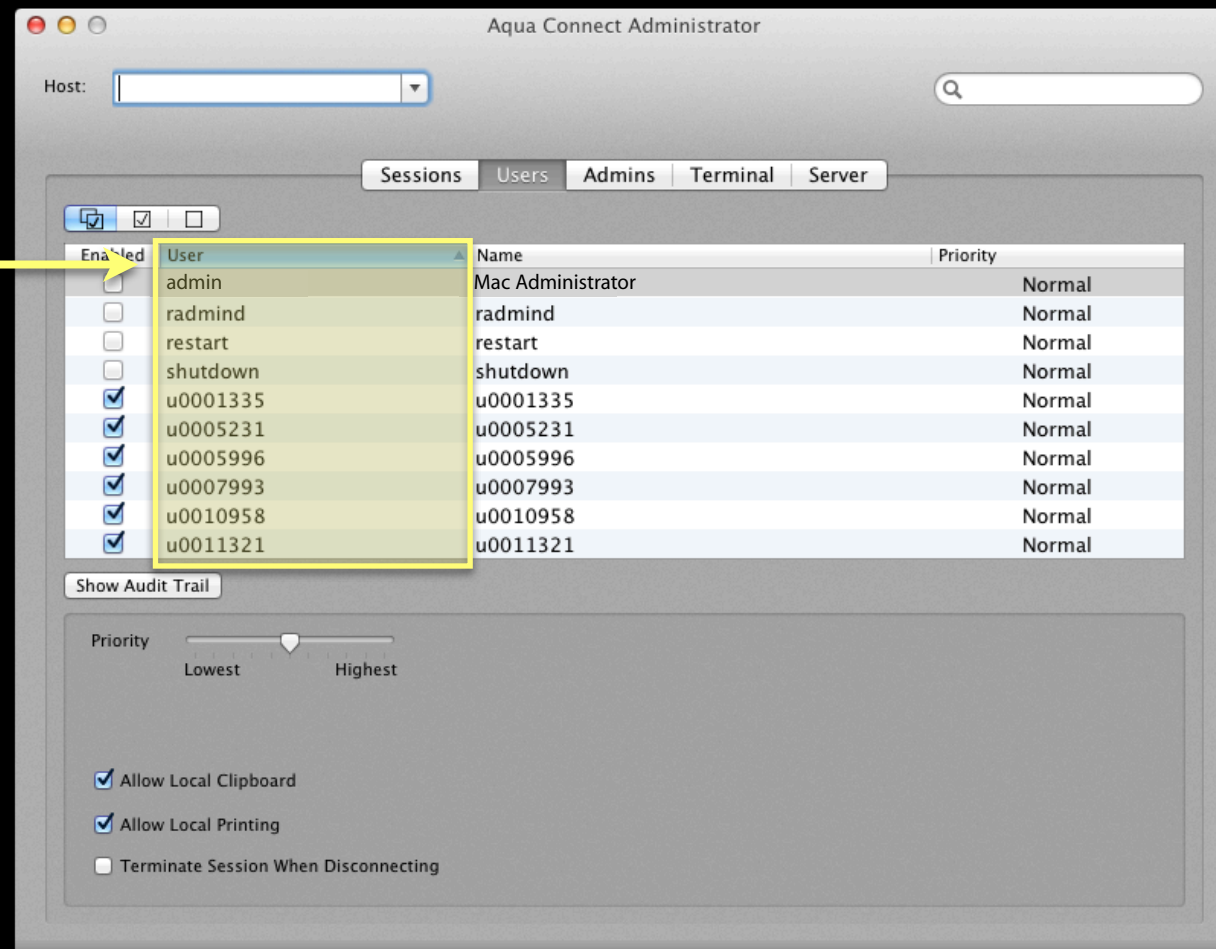
Show Disabled
Show disabled users only



Aqua Connect Remote Desktop Services Administration Tool



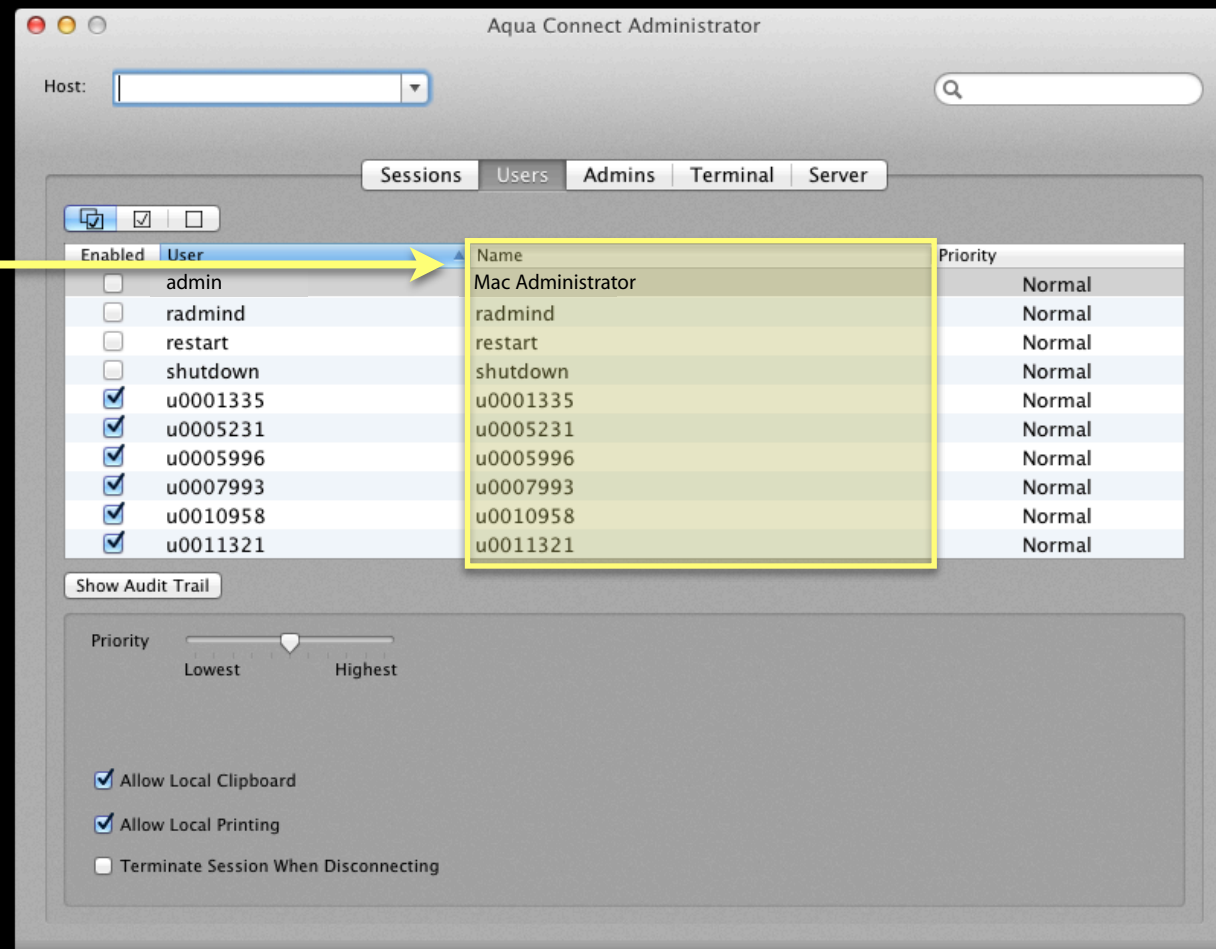
Login Name
Directory Service User's Login Name



Aqua Connect Remote Desktop Services Administration Tool



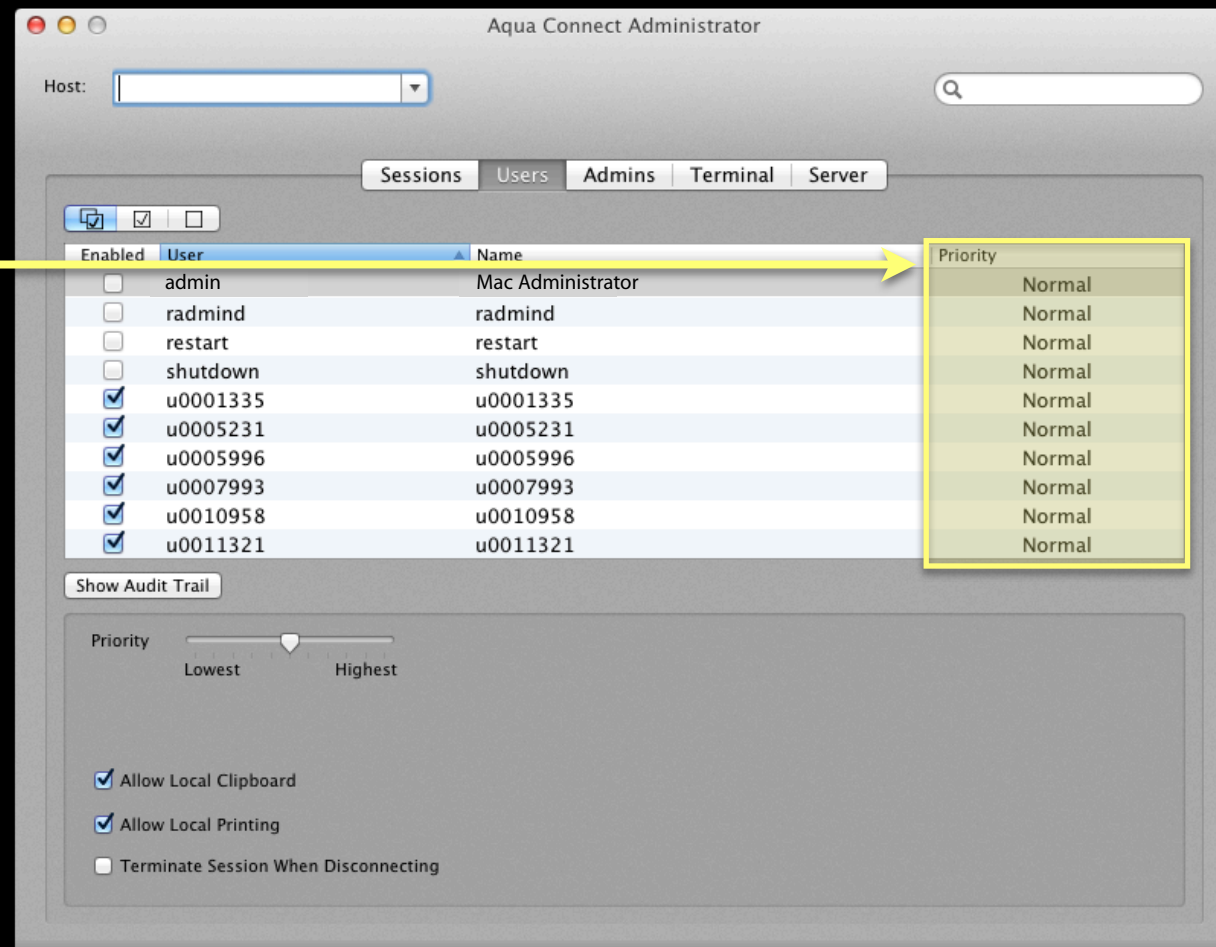
Real Name
Directory Service User's Real Name



Aqua Connect Remote Desktop Services Administration Tool



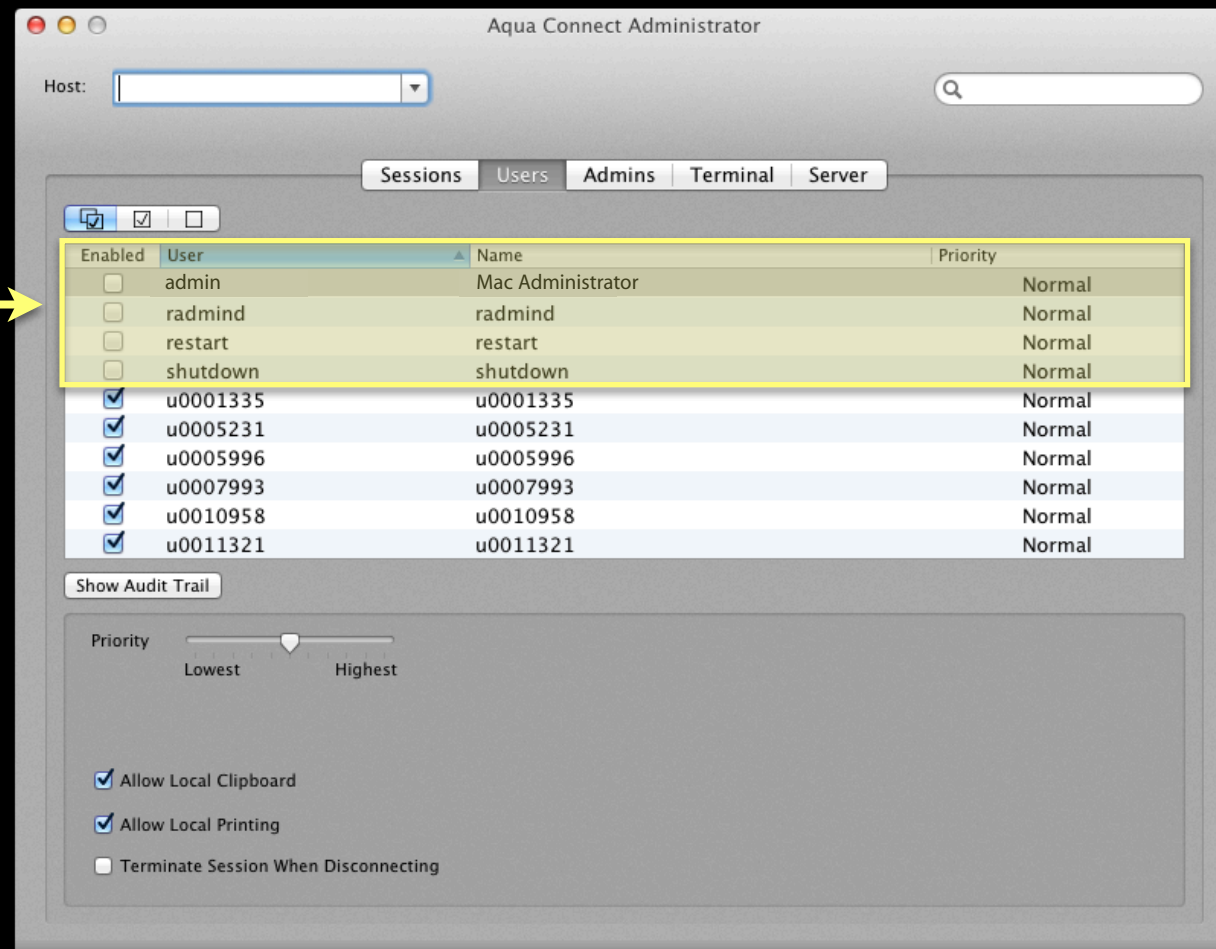
Priority
Session CPU Time Allocation



Aqua Connect Remote Desktop Services Administration Tool



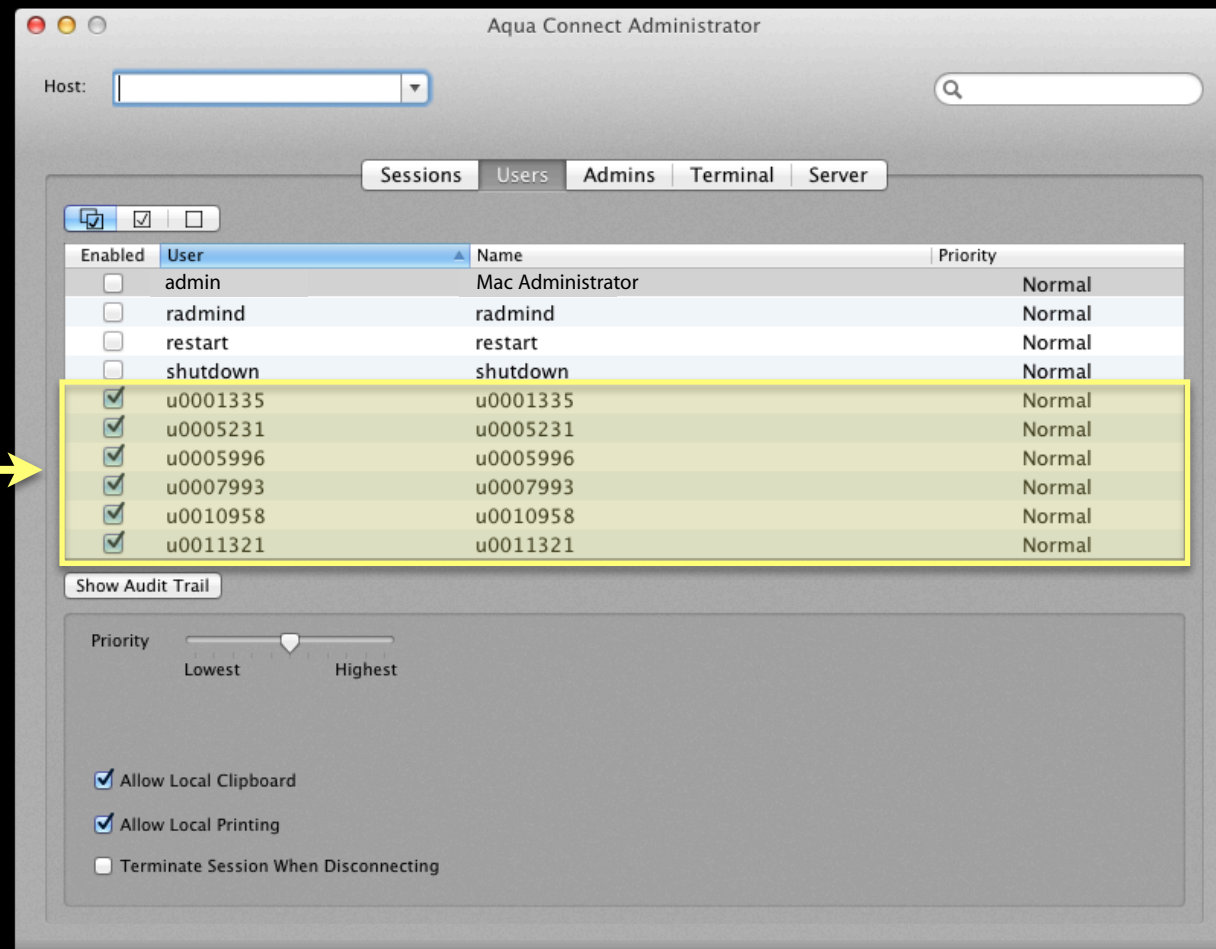
Local Accounts
Server Local Accounts



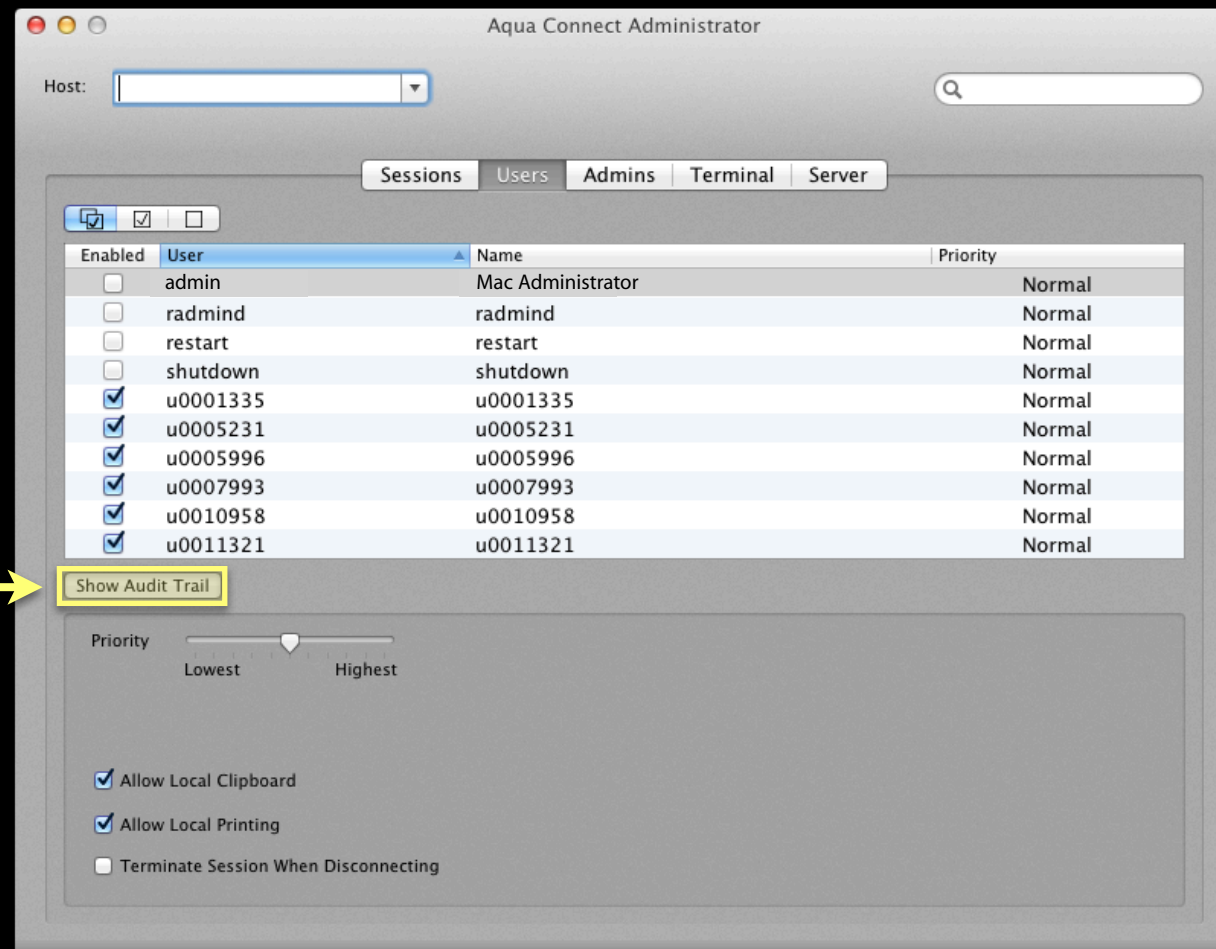
Aqua Connect Remote Desktop Services Administration Tool



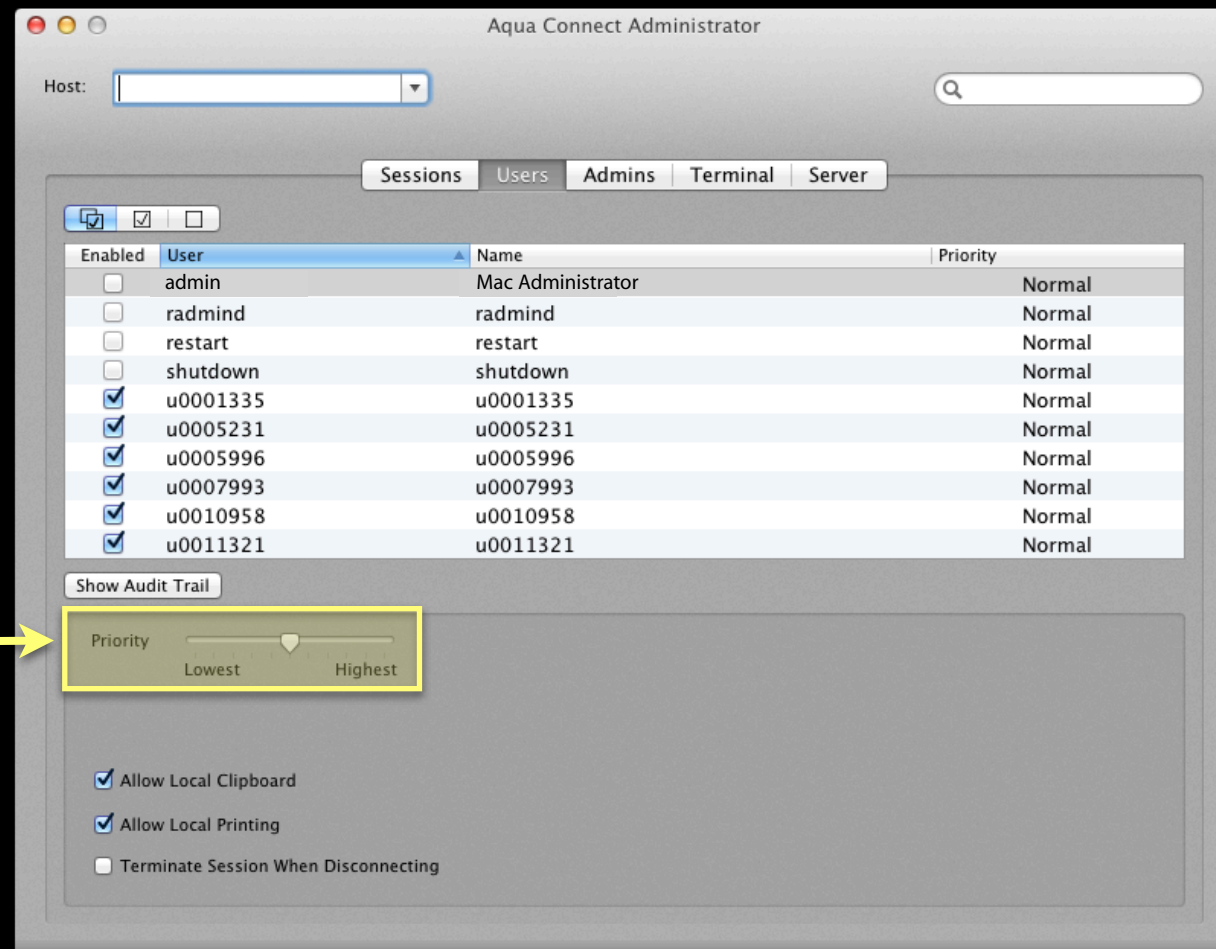
Network Accounts
Network Directory Service
Open Directory, Active Directory, LDAP, etc.



Aqua Connect Remote Desktop Services Administration Tool

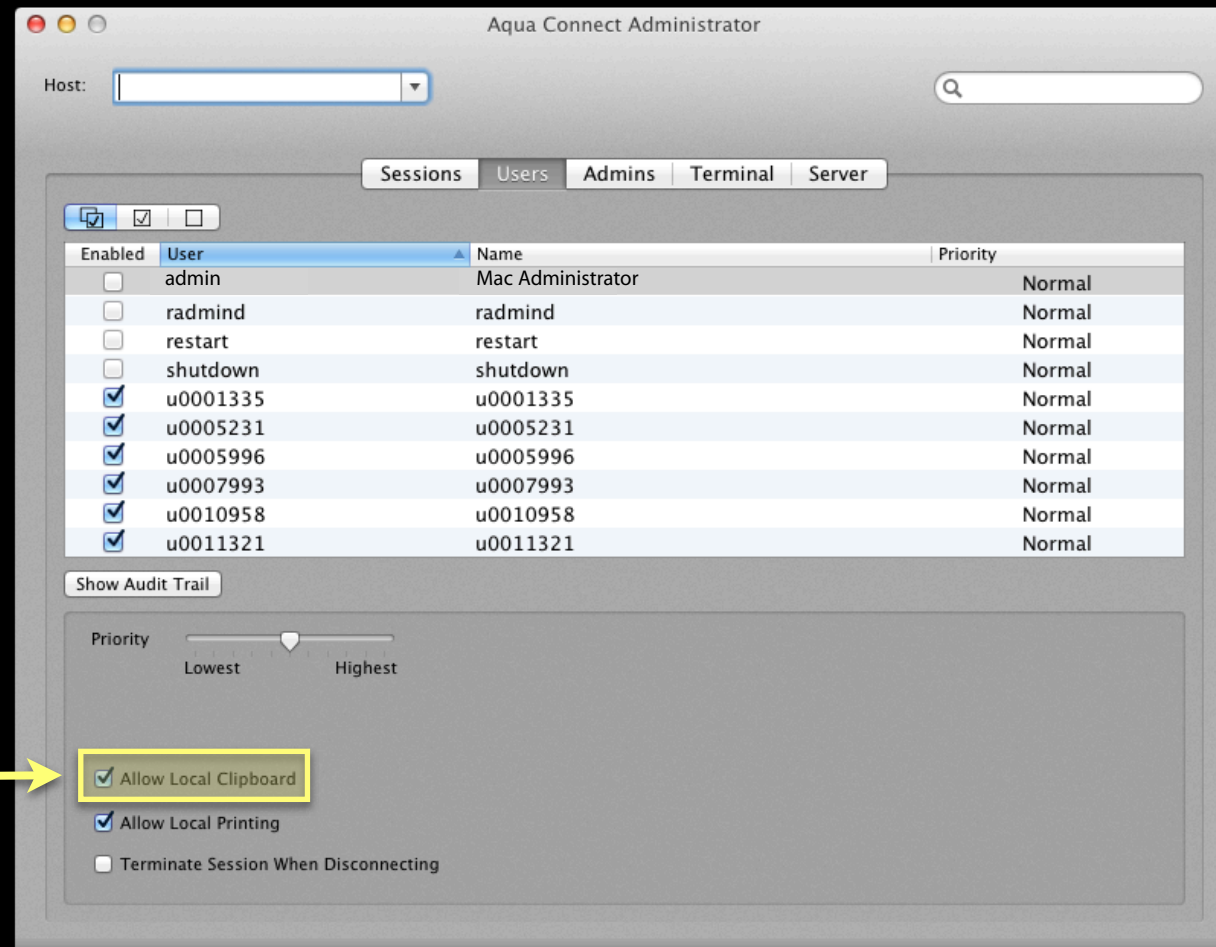


Aqua Connect Remote Desktop Services Administration Tool



Priority
Modifies Session CPU Time
Per User
Retained on account future sessions

Aqua Connect Remote Desktop Services Administration Tool

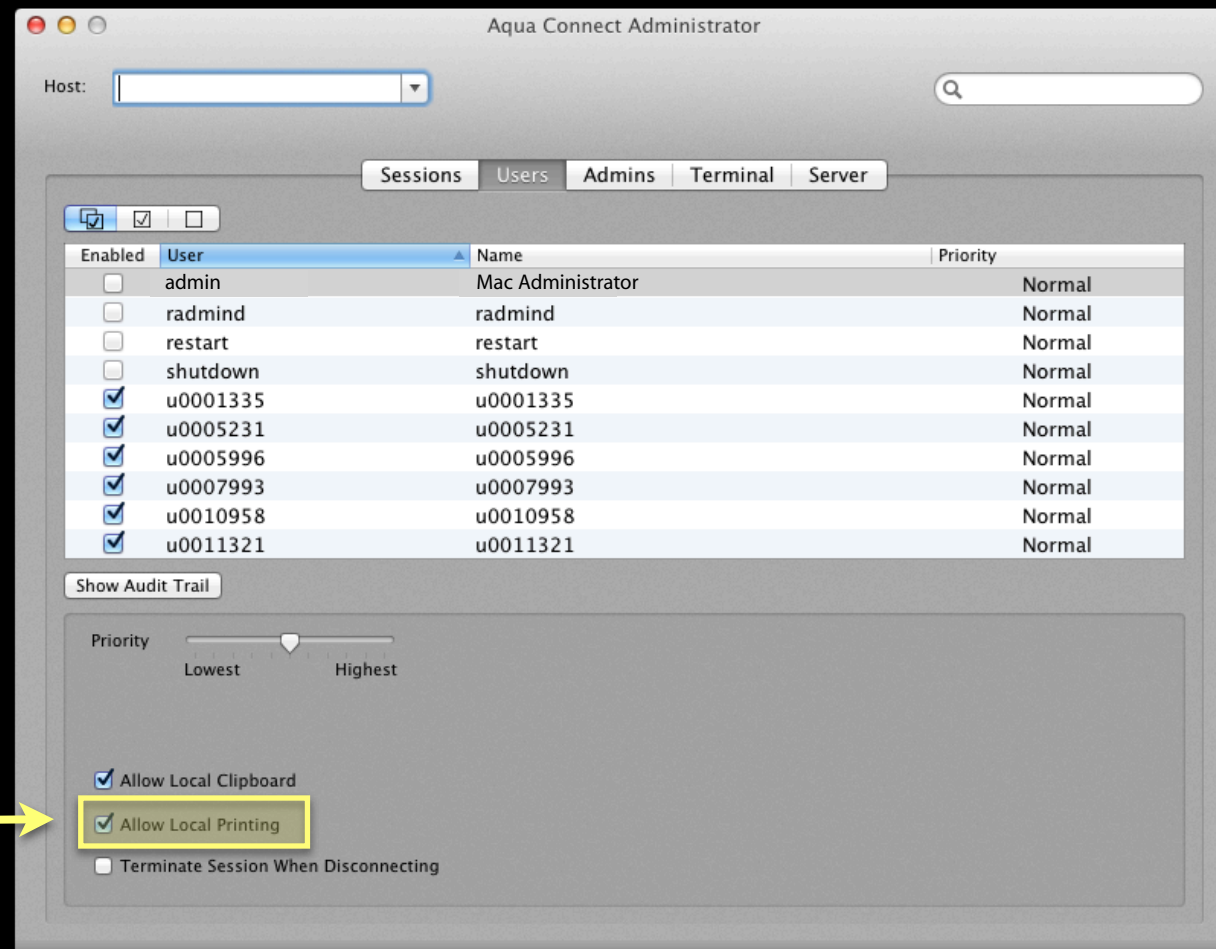


Note

This option is available to secure environments where they want to restrict copying to local clipboard from remote sessions.

Allow Local Clipboard
Per User

Aqua Connect Remote Desktop Services Administration Tool

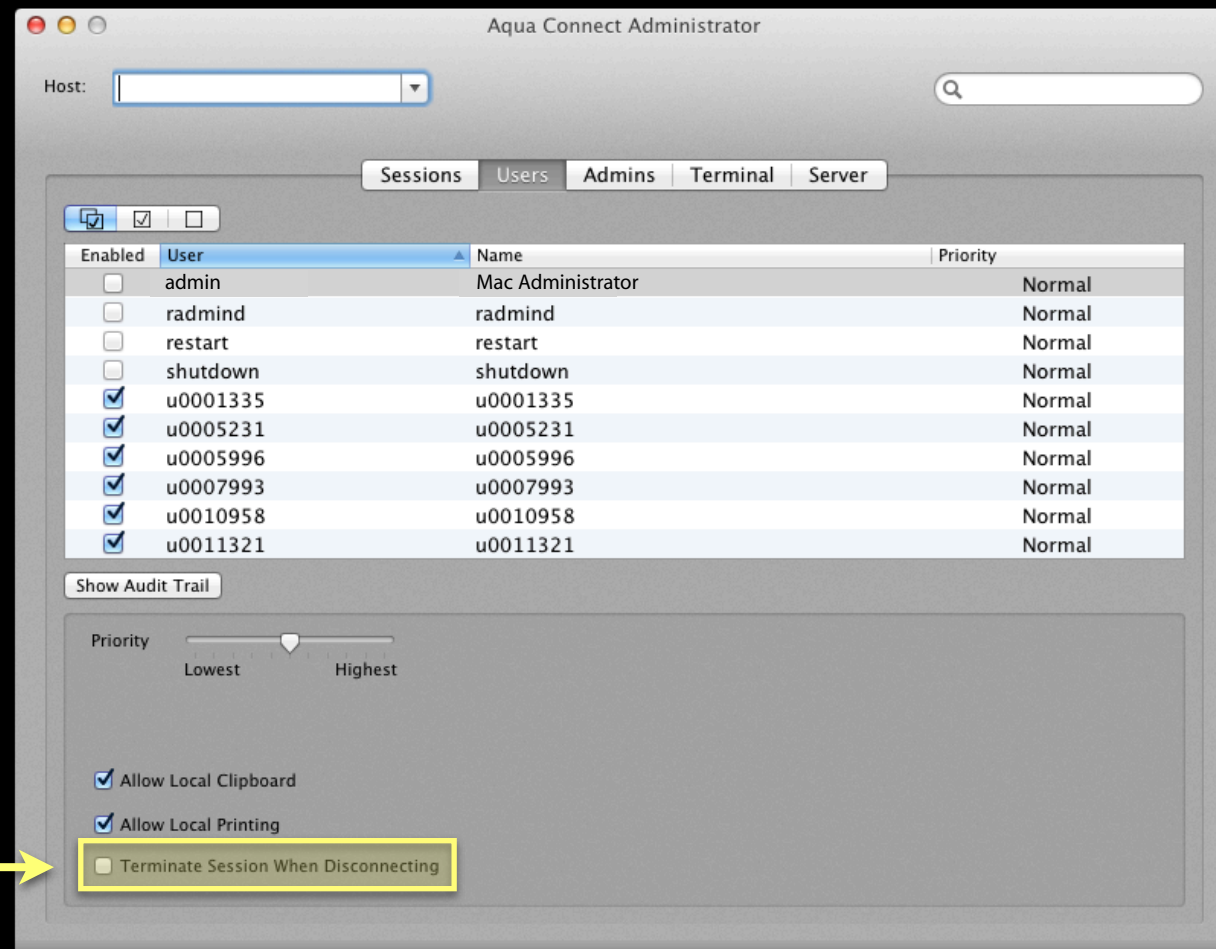


Note

This option is available to secure environments where they want to restrict local printing from remote sessions.

Allow Local Printing
Per User

Aqua Connect Remote Desktop Services Administration Tool



Terminate Session on Disconnect

Per User

Setting retained on next login

Aqua Connect Remote Desktop Services Administration Tool



Users

- Enable/disable or other attributes by modifying plist files located:

`/Library/Application Support/ACTS/User`

For example...

`ls "/Library/Application Support/ACTS/User"`

`08345E84-9A43-41CD-9782-30FD3B2968A6.plist`

`12EFA555-C96A-4B30-93A7-74B13585A65E.plist`

`33F7A765-CB96-4E64-8A01-85B2BE804A7A.plist`

`79082ECD-63BD-47F2-ABBD-3FEC014F72AB.plist`



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Aqua Connect Remote Desktop Services Administration Tool



Users

- For example, the radmind user plist file:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>allowClipboard</key>
  <integer>1</integer>
  <key>allowPrinting</key>
  <integer>1</integer>
  <key>enabled</key>
  <integer>0</integer>
  <key>generatedUID</key>
  <string>12EFA555-C96A-4B30-93A7-74B13585A65E</string>
  <key>priority</key>
  <integer>0</integer>
  <key>recordName</key>
  <string>radmind</string>
  <key>sessionID</key>
  <integer>0</integer>
  <key>terminateOnDisconnect</key>
  <integer>0</integer>
  <key>uniqueID</key>
  <string>603</string>
  <key>uniqueUserIdentifier</key>
  <string>12EFA555-C96A-4B30-93A7-74B13585A65E</string>
</dict>
</plist>
```

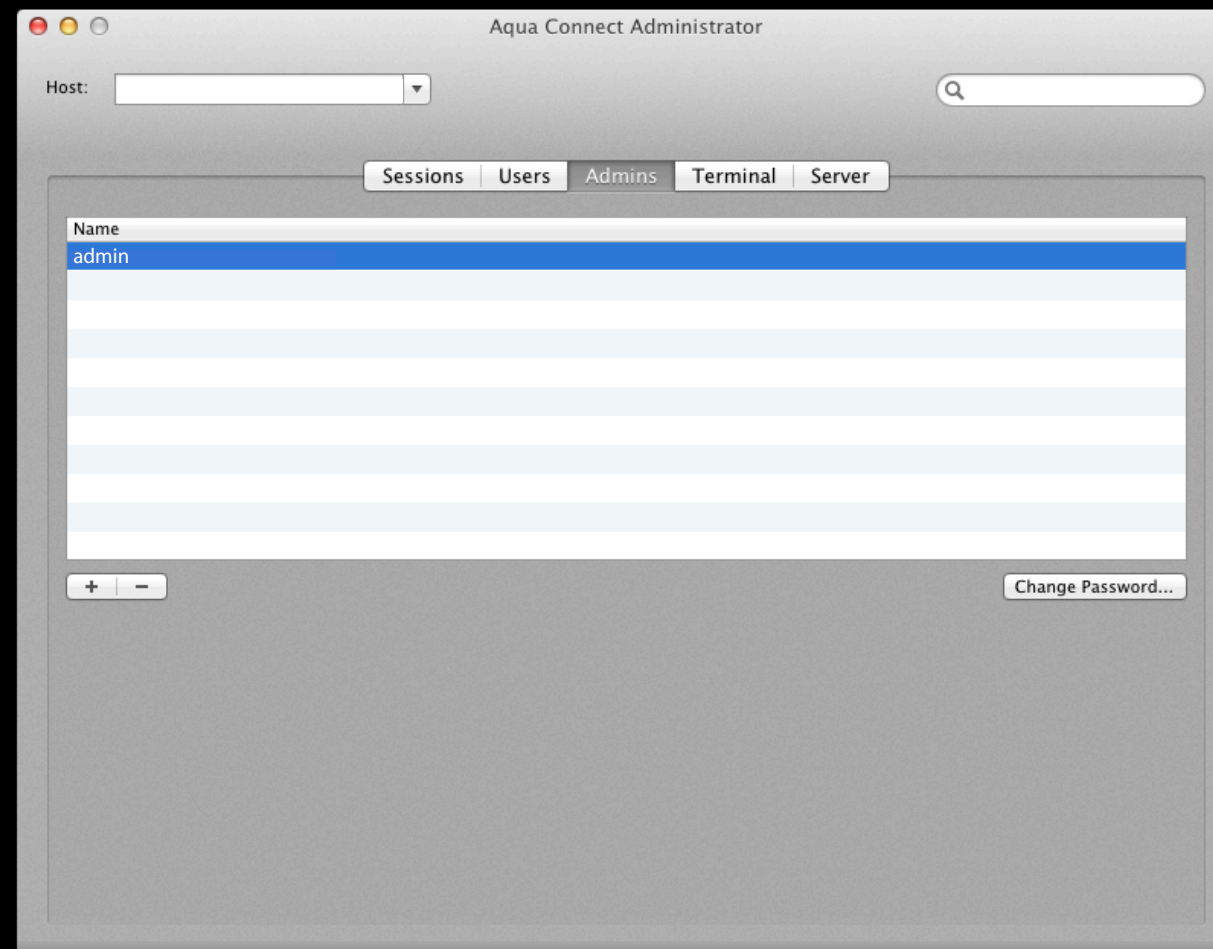


Aqua Connect Remote Desktop Services Administration Tool



Admins

- Account(s) prevent unauthorized use of admin tool



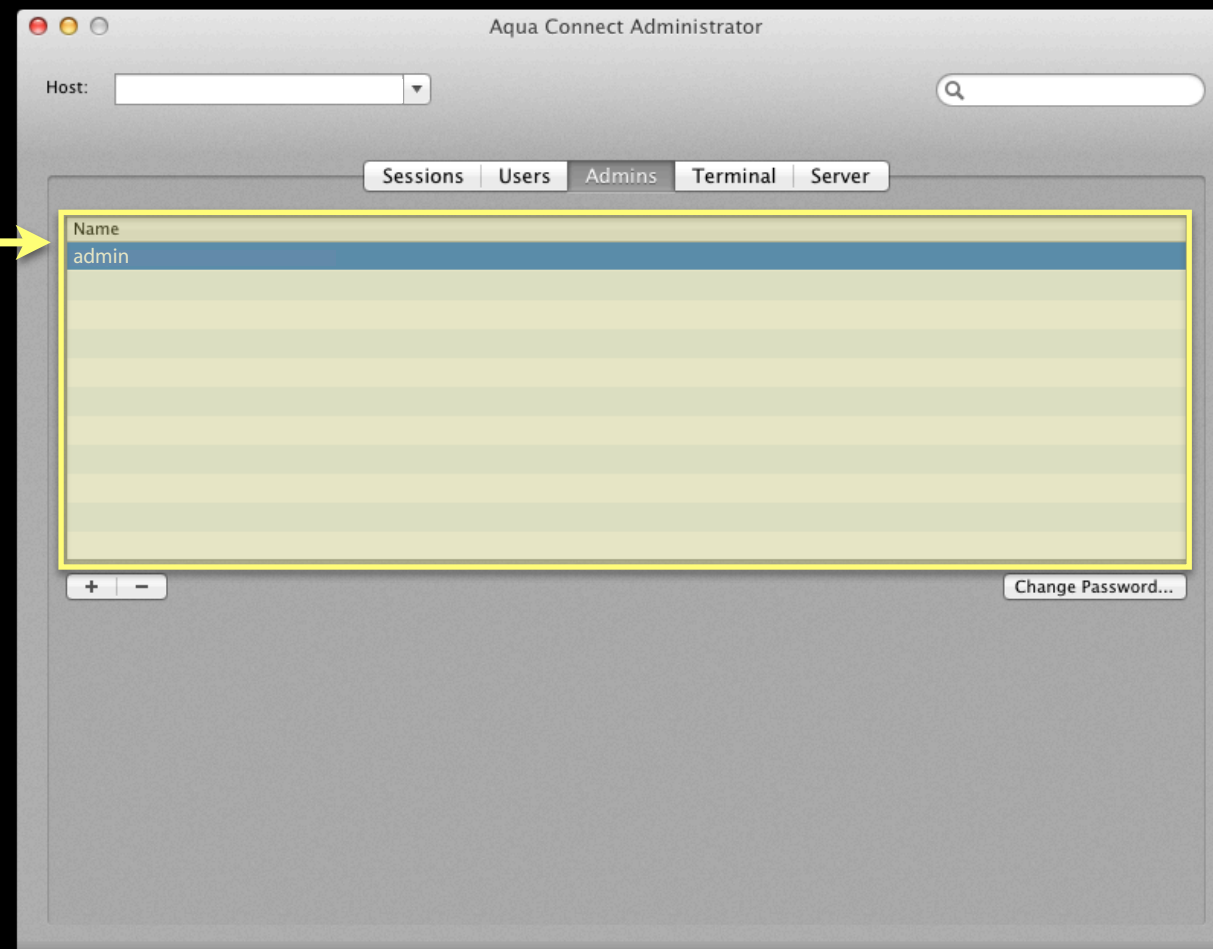
Aqua Connect Remote Desktop Services Administration Tool



Admins

- Accounts tied to application configuration on ACRDS
- Does NOT use local or network OS X accounts

Aqua Connect Admin List



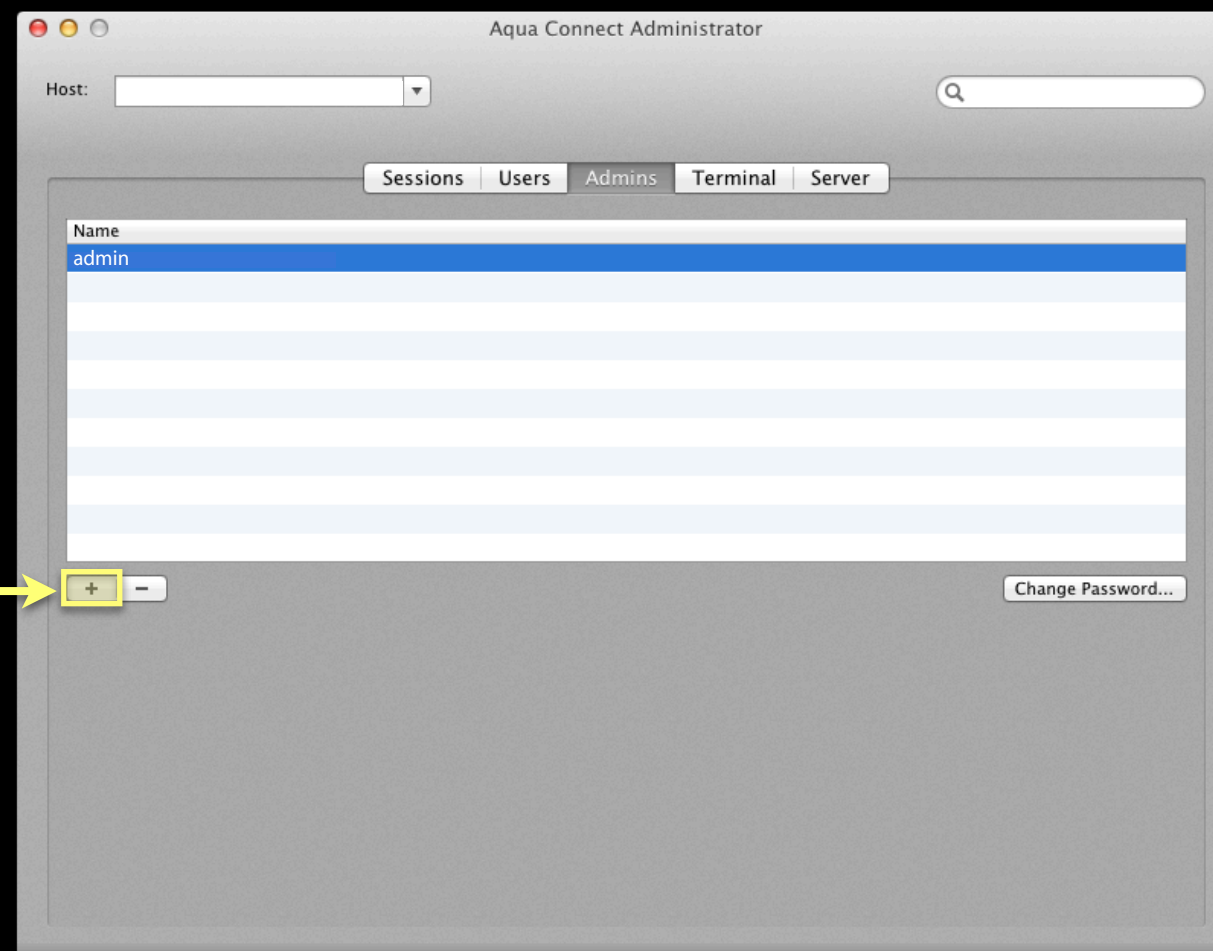
Aqua Connect Remote Desktop Services Administration Tool



Admins

- Add administrator ACRDSAT accounts

Add Admin



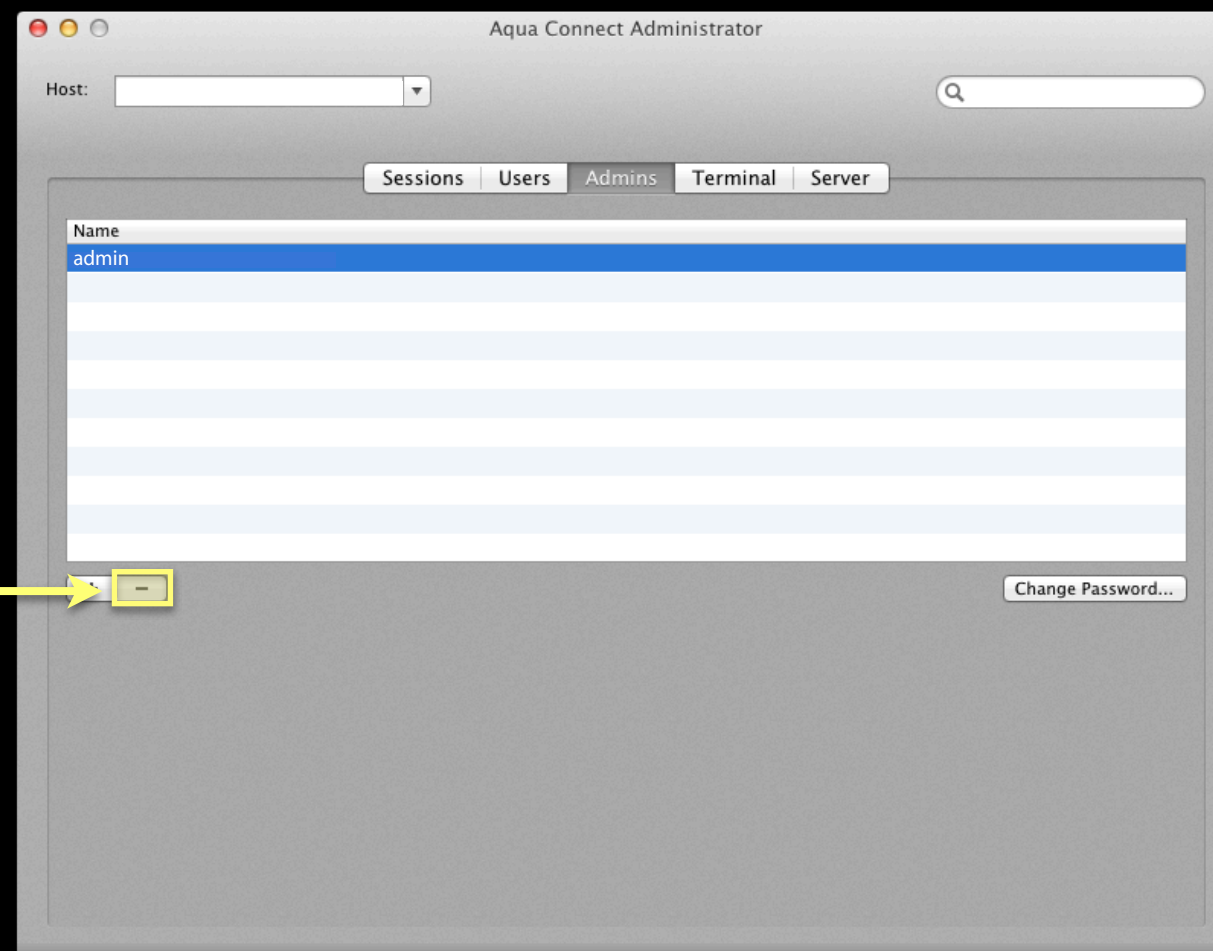
Aqua Connect Remote Desktop Services Administration Tool



Admins

- Remove administrative ACRDSAT accounts

Remove Admin

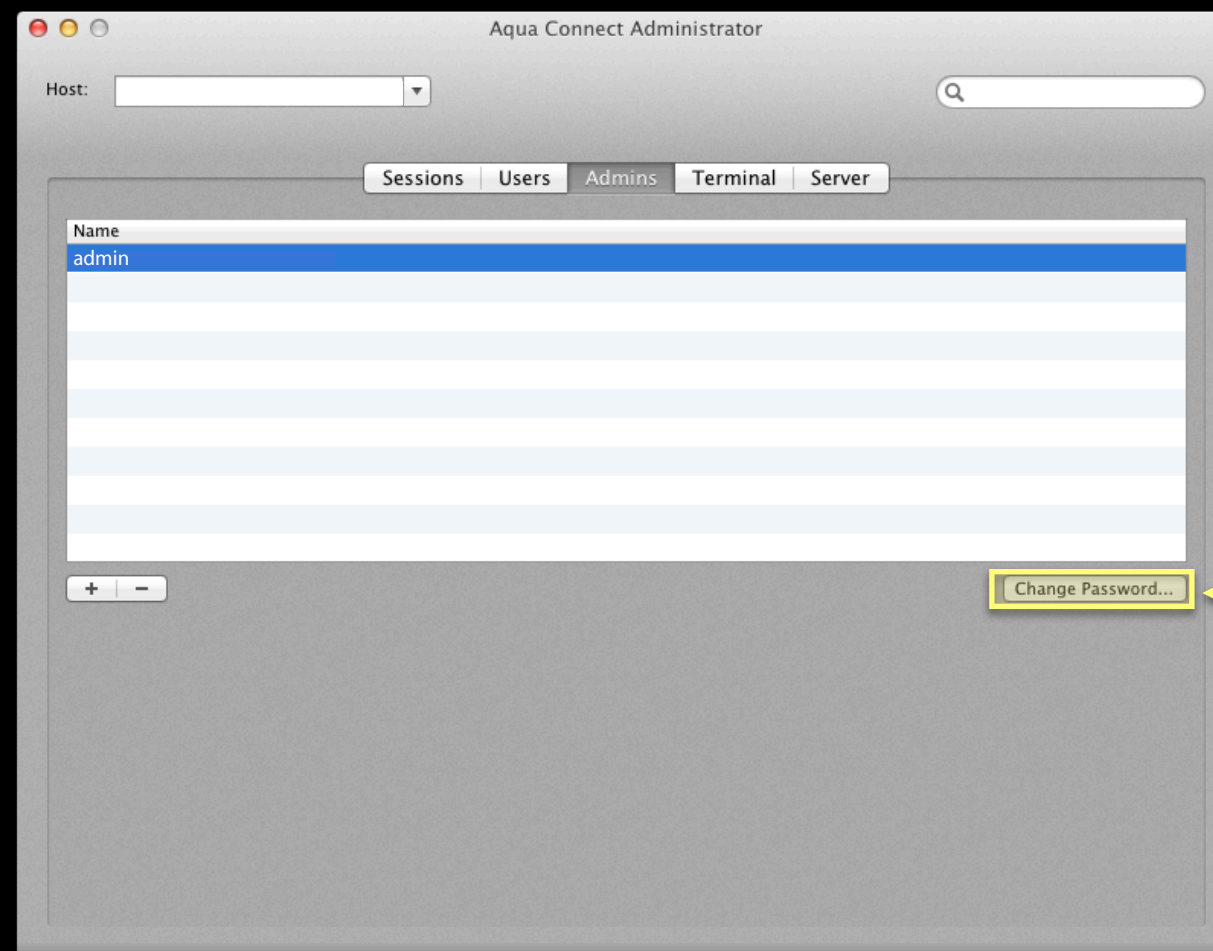


Aqua Connect Remote Desktop Services Administration Tool



Admins

- Change ACRDSAT administrative account password



Change Admin Password



Aqua Connect Remote Desktop Services Administration Tool



Admins

- Accounts plist files are created in this directory:
`/Library/Application Support/ACTS/Admins`
- For example, the admin.plist file:
`/Library/Application Support/ACTS/Admins/admin.plist`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>adminName</key>
  <string>admin</string>
  <key>adminPass</key>
  <data>
    l7wYaxhJLrNpNX4i/hquJQ==
  </data>
</dict>
</plist>
```

- Modify it with tools like defaults, plist_buddy, etc.
- Or created needed admin accounts plist files

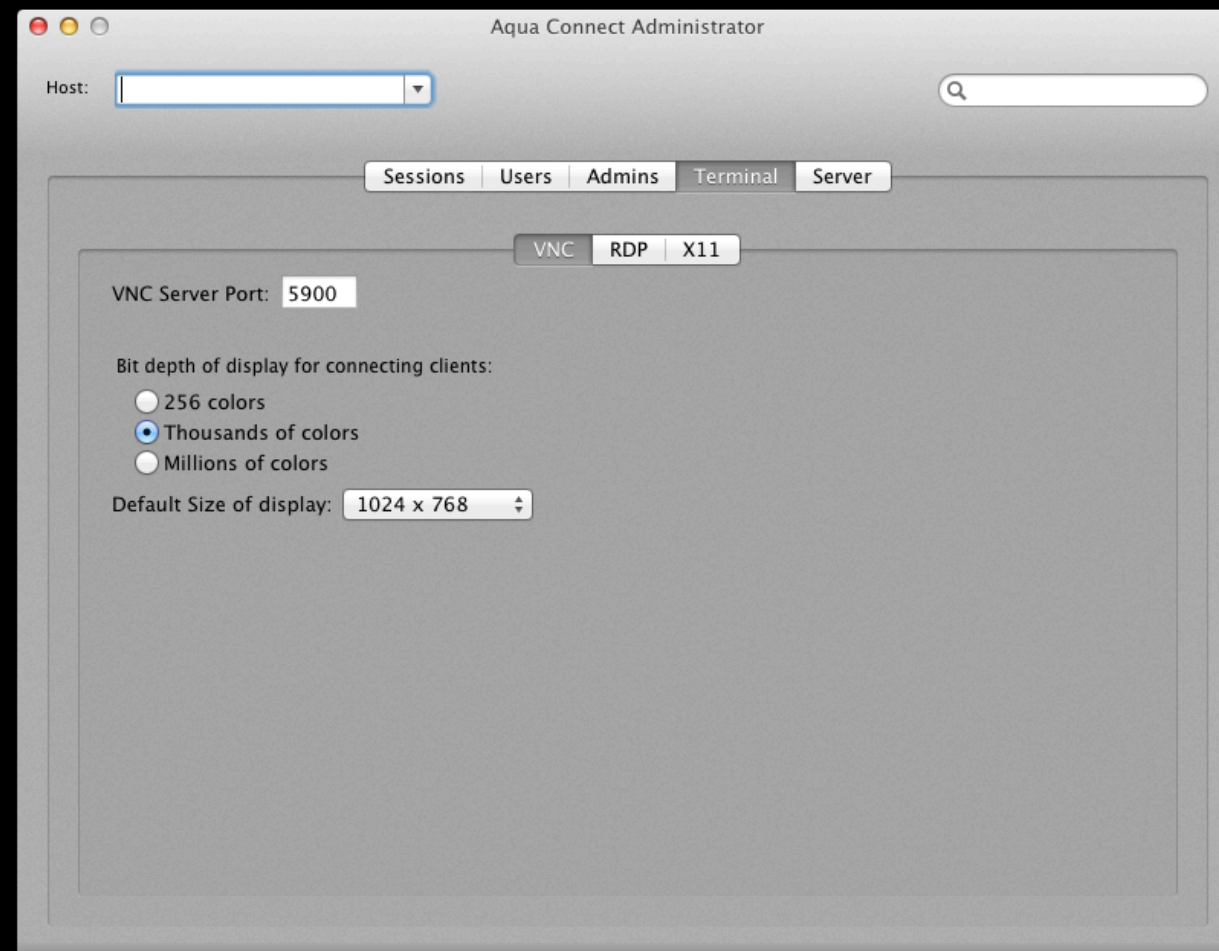


Aqua Connect Remote Desktop Services Administration Tool



Terminal

- Settings for protocols: VNC, RDP & X11



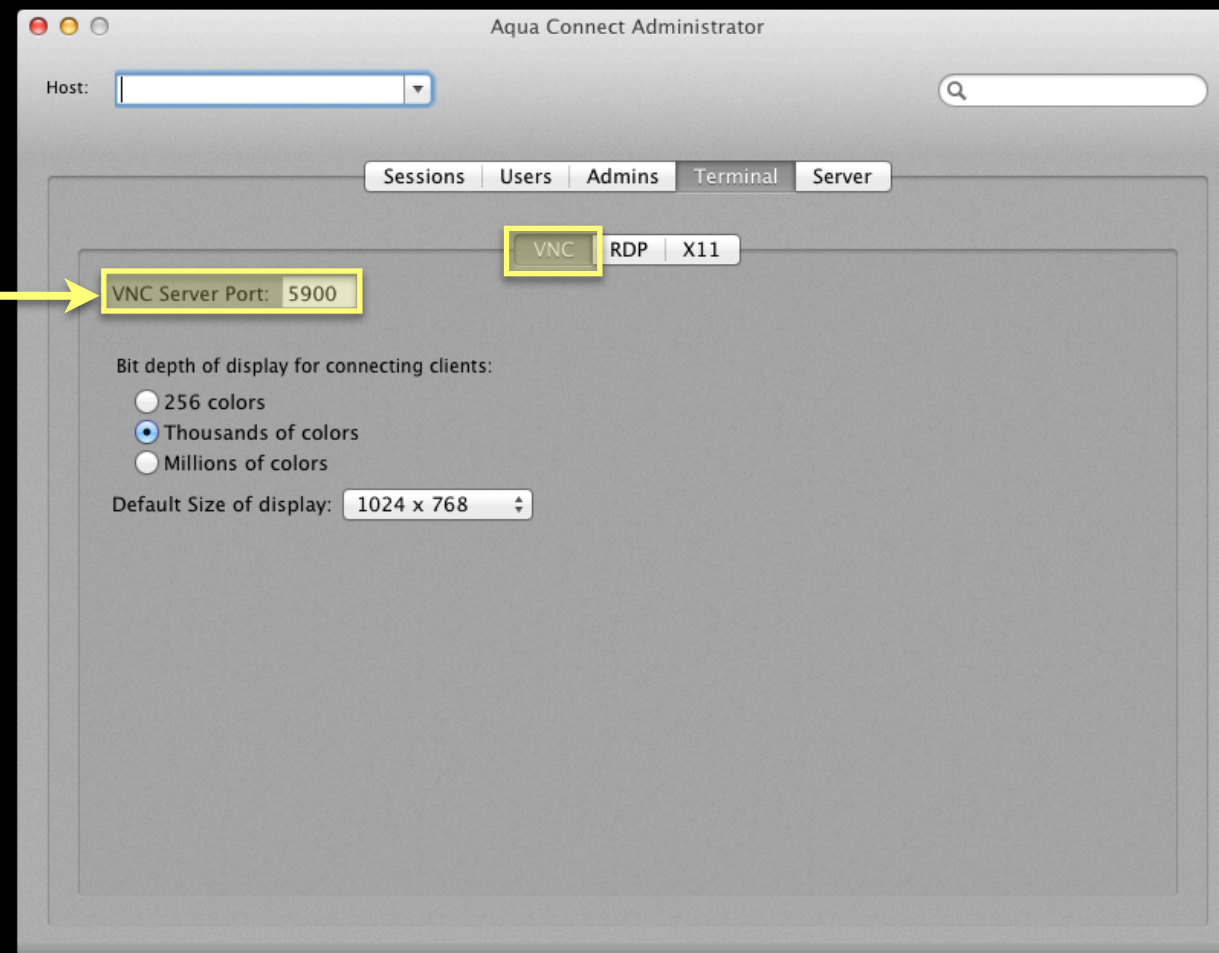
Aqua Connect Remote Desktop Services Administration Tool



Terminal

• VNC Options:

VNC Server Port
Default port is 5900
Value can be modified anytime



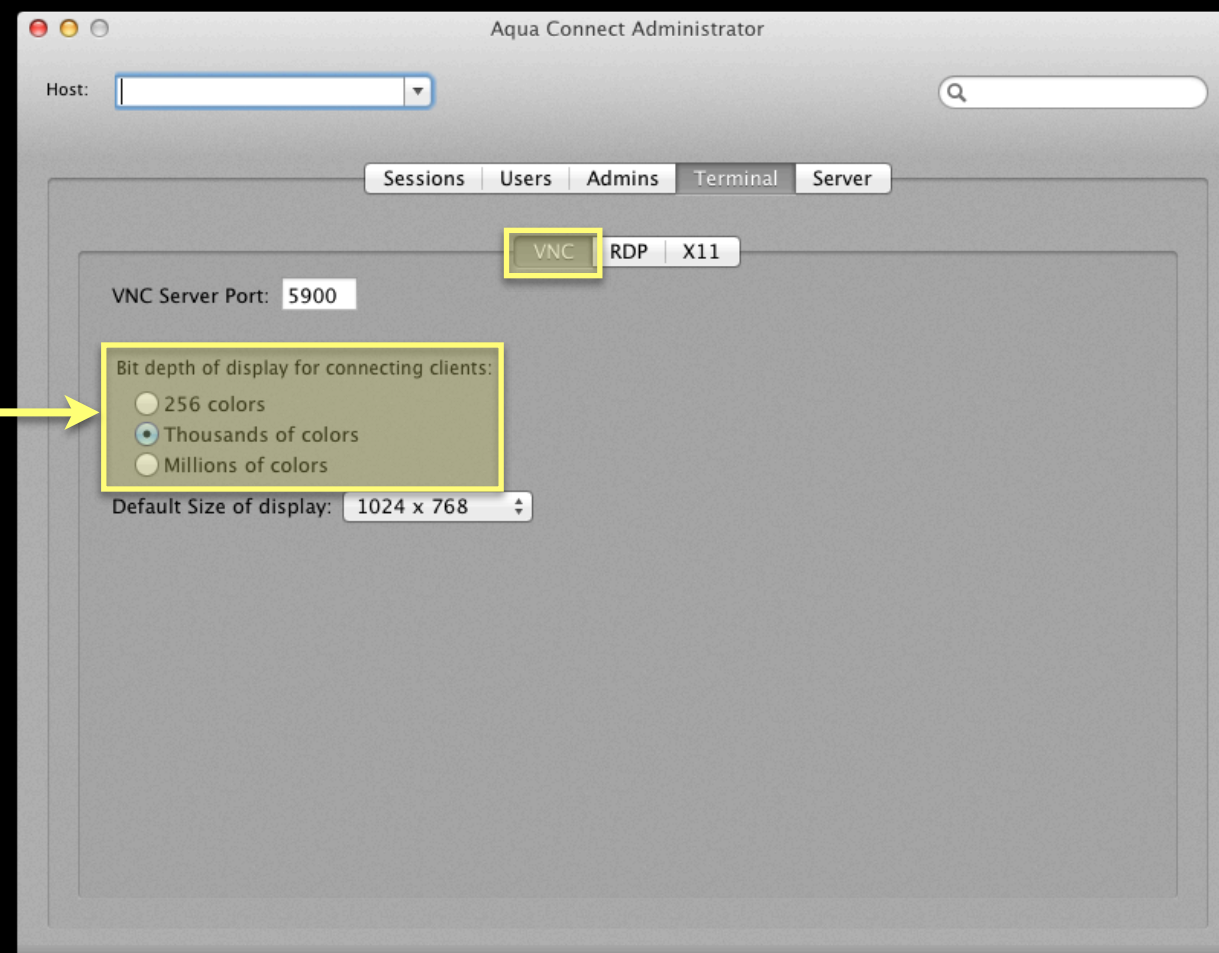
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Aqua Connect Remote Desktop Services Administration Tool



Terminal

• VNC Options:



Bit Depth

256, thousands or millions of colors
Value can be modified anytime



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Aqua Connect Remote Desktop Services Administration Tool



Terminal

• VNC Options:

Display Resolution
256, thousands or millions of colors
Value can be modified anytime

Aqua Connect Administrator

Host:

Sessions Users Admins **Terminal** Server

VNC RDP X11

VNC Server Port: 5900

Bit depth of display for connecting clients:

☐ 256 colors
☒ Thousands of colors
☐ Millions of colors

Default Size of display: 1024 x 768

640 x 400
640 x 480
720 x 480
800 x 500
800 x 600
1024 x 640
✓ 1024 x 768
1152 x 720
1152 x 864
1152 x 870
1280 x 800
1280 x 960
1280 x 1024
1400 x 875
1400 x 1050
1440 x 900
1600 x 1200
1680 x 1050
1792 x 1344
1920 x 1200
1920 x 1440
2560 x 1600



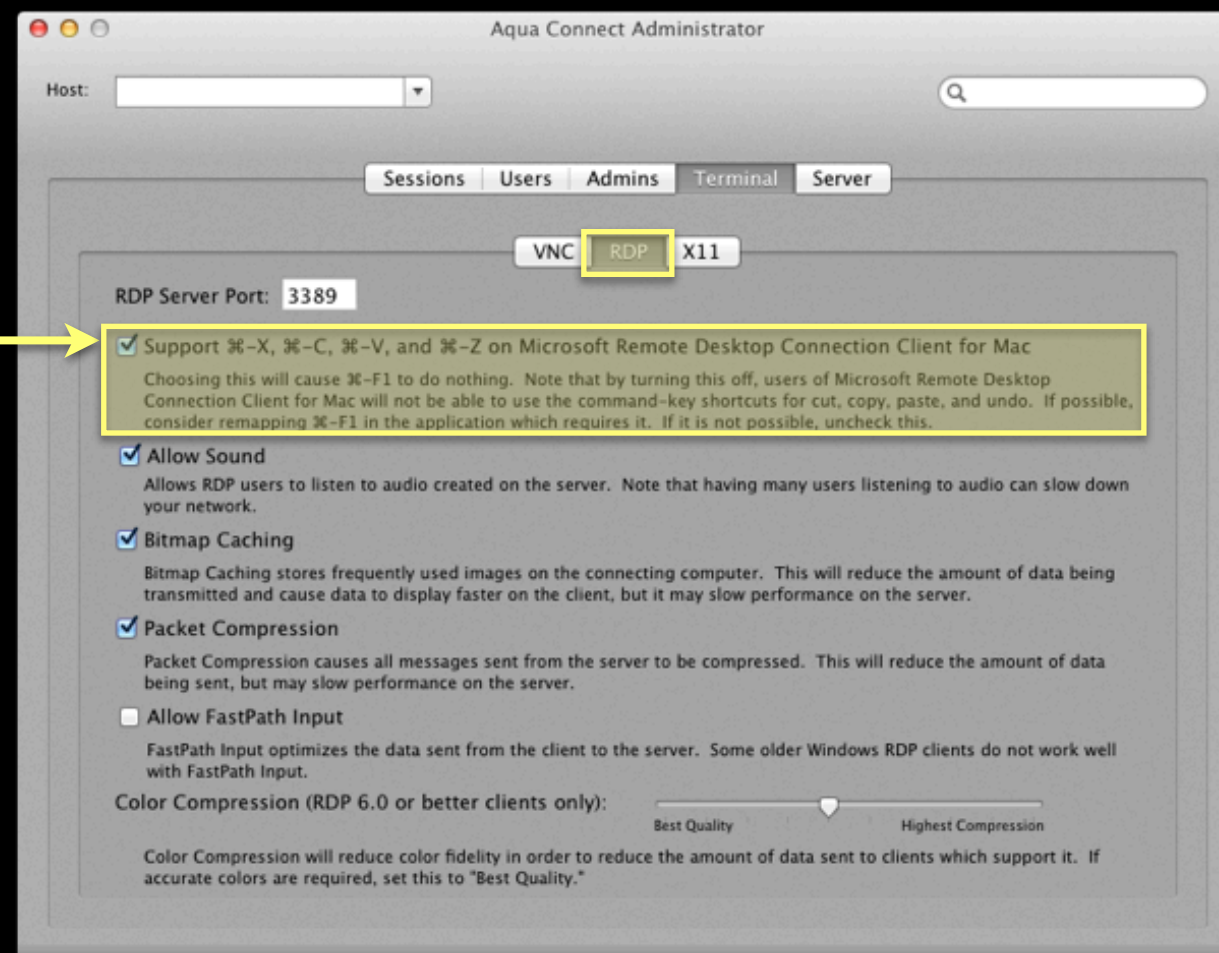
Aqua Connect Remote Desktop Services Administration Tool



Terminal

- RDP Options:

Microsoft Remote Desktop Connection
Command Key Support



Edit	View	Window	Help
Undo			⌘Z
Redo			⇧⌘Z
Cut			⌘X
Copy			⌘C
Paste			⌘V
Paste and Match Style			⇧⇧⌘V
Delete			
Select All			⌘A
Start Dictation			fn fn
Special Characters...			⇧⌘T



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Aqua Connect Remote Desktop Services Administration Tool



Terminal

- RDP Options:

Allow Audio

The screenshot shows the Aqua Connect Administrator window with the 'Terminal' tab selected. Within the 'Terminal' tab, the 'RDP' sub-tab is active. The 'RDP Server Port' is set to 3389. A yellow box highlights the 'Allow Sound' checkbox, which is checked. A yellow arrow points from the text 'Allow Audio' to this checkbox. Other options include 'Support ⌘-X, ⌘-C, ⌘-V, and ⌘-Z on Microsoft Remote Desktop Connection Client for Mac' (checked), 'Bitmap Caching' (checked), 'Packet Compression' (checked), and 'Allow FastPath Input' (unchecked). At the bottom, there is a 'Color Compression' slider set to 'Best Quality'.

Aqua Connect Administrator

Host:

Sessions Users Admins **Terminal** Server

VNC **RDP** X11

RDP Server Port:

☒ Support ⌘-X, ⌘-C, ⌘-V, and ⌘-Z on Microsoft Remote Desktop Connection Client for Mac
Choosing this will cause ⌘-F1 to do nothing. Note that by turning this off, users of Microsoft Remote Desktop Connection Client for Mac will not be able to use the command-key shortcuts for cut, copy, paste, and undo. If possible, consider remapping ⌘-F1 in the application which requires it. If it is not possible, uncheck this.

☒ **Allow Sound**
Allows RDP users to listen to audio created on the server. Note that having many users listening to audio can slow down your network.

☒ Bitmap Caching
Bitmap Caching stores frequently used images on the connecting computer. This will reduce the amount of data being transmitted and cause data to display faster on the client, but it may slow performance on the server.

☒ Packet Compression
Packet Compression causes all messages sent from the server to be compressed. This will reduce the amount of data being sent, but may slow performance on the server.

☐ Allow FastPath Input
FastPath Input optimizes the data sent from the client to the server. Some older Windows RDP clients do not work well with FastPath Input.

Color Compression (RDP 6.0 or better clients only): Best Quality Highest Compression
Color Compression will reduce color fidelity in order to reduce the amount of data sent to clients which support it. If accurate colors are required, set this to "Best Quality."

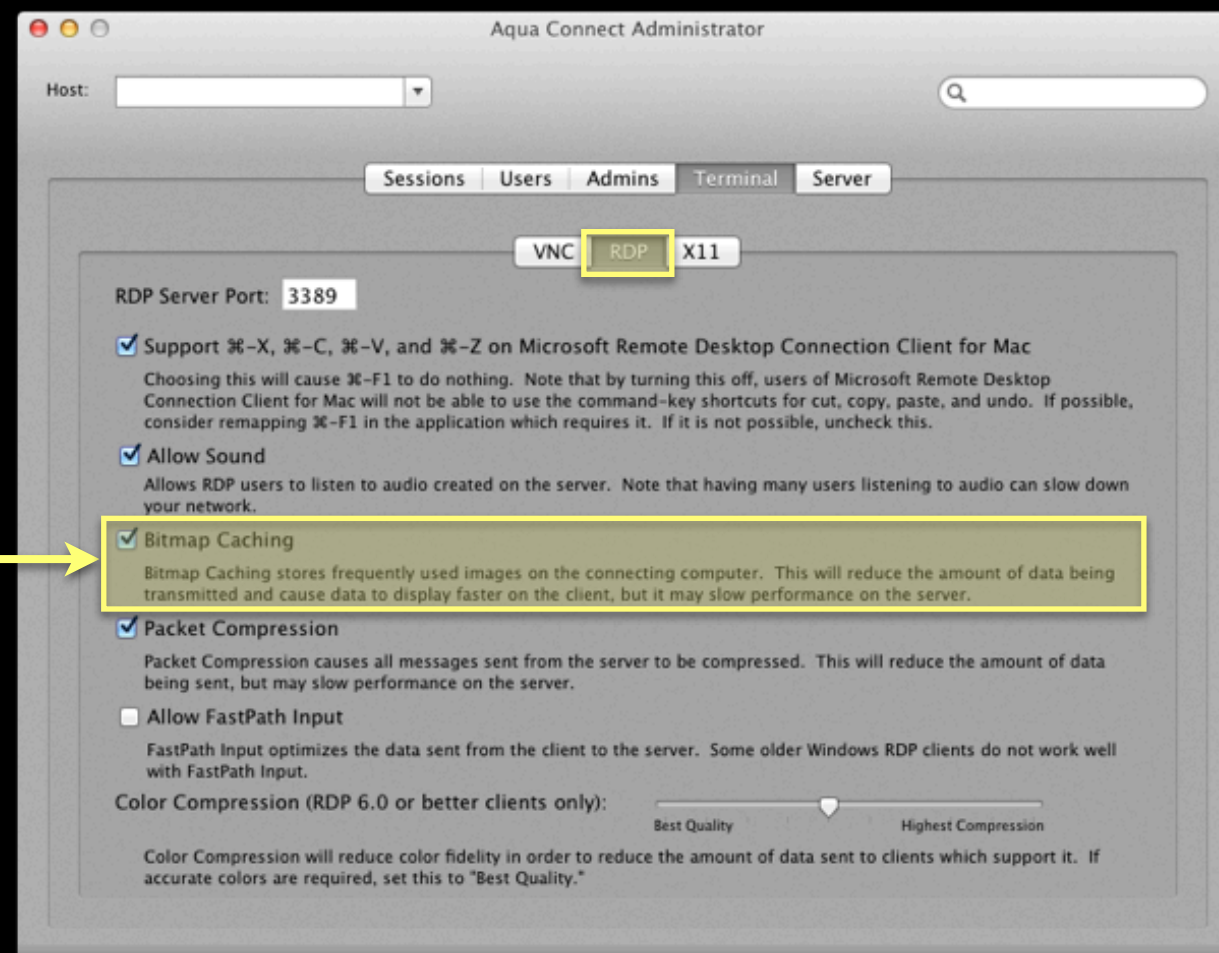


Aqua Connect Remote Desktop Services Administration Tool



Terminal

- RDP Options:



Bitmap Caching

Reduced Amount of Data Transferred to Client



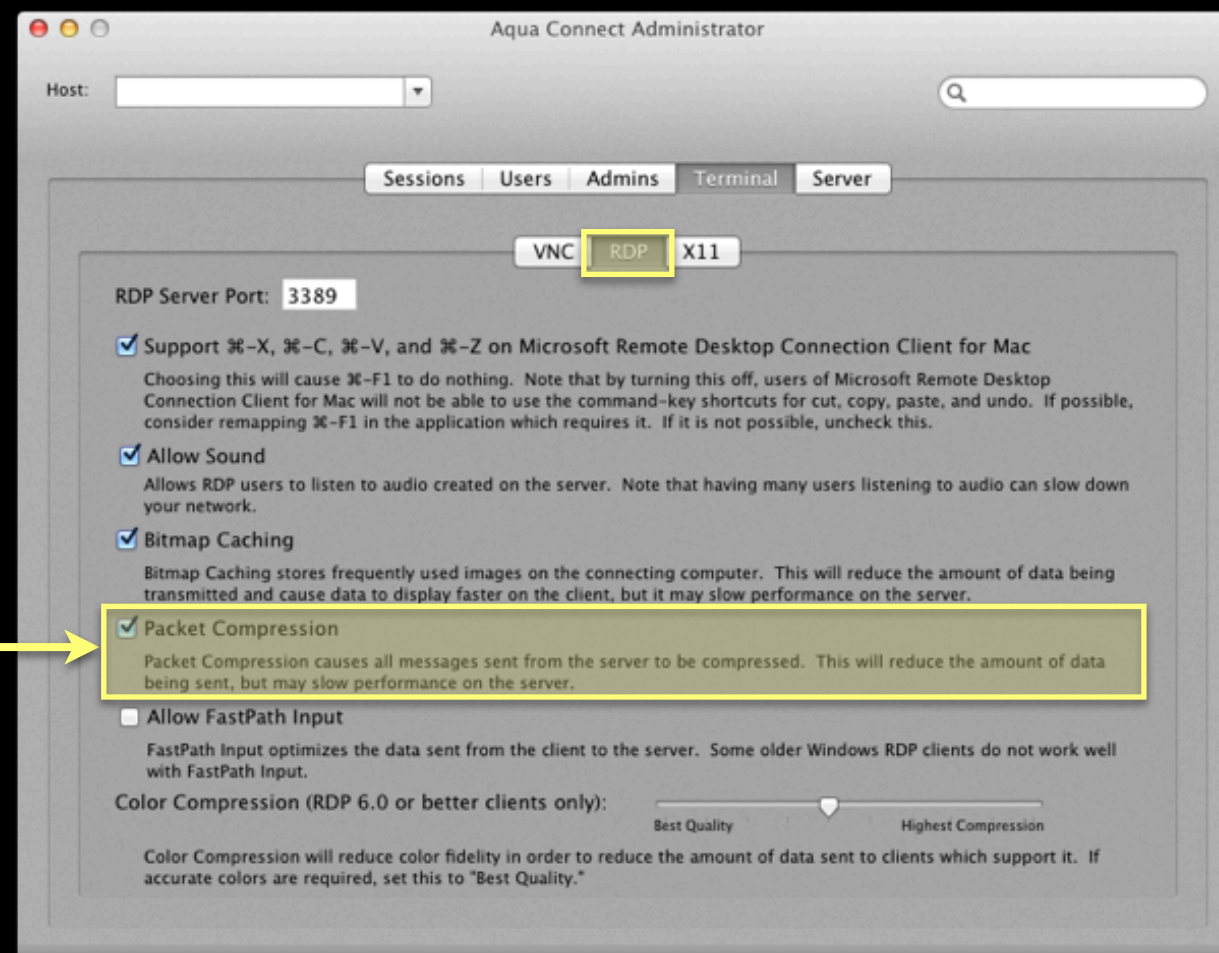
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Aqua Connect Remote Desktop Services Administration Tool



Terminal

- RDP Options:



Packet Compression
Compresses Data Sent to Client



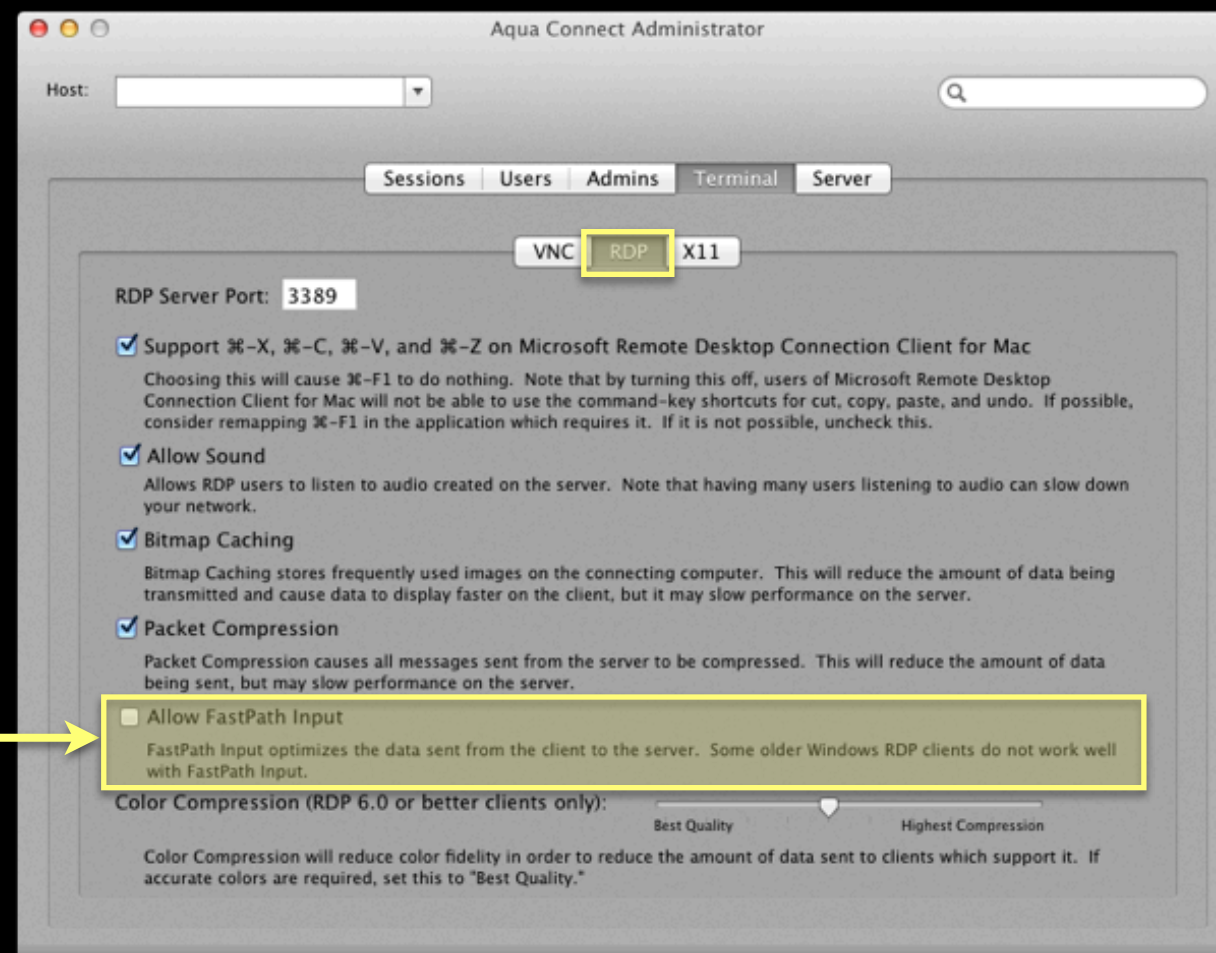
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Aqua Connect Remote Desktop Services Administration Tool



Terminal

- RDP Options:



Allow FasPath Input

Not support on older Windows RDP Clients



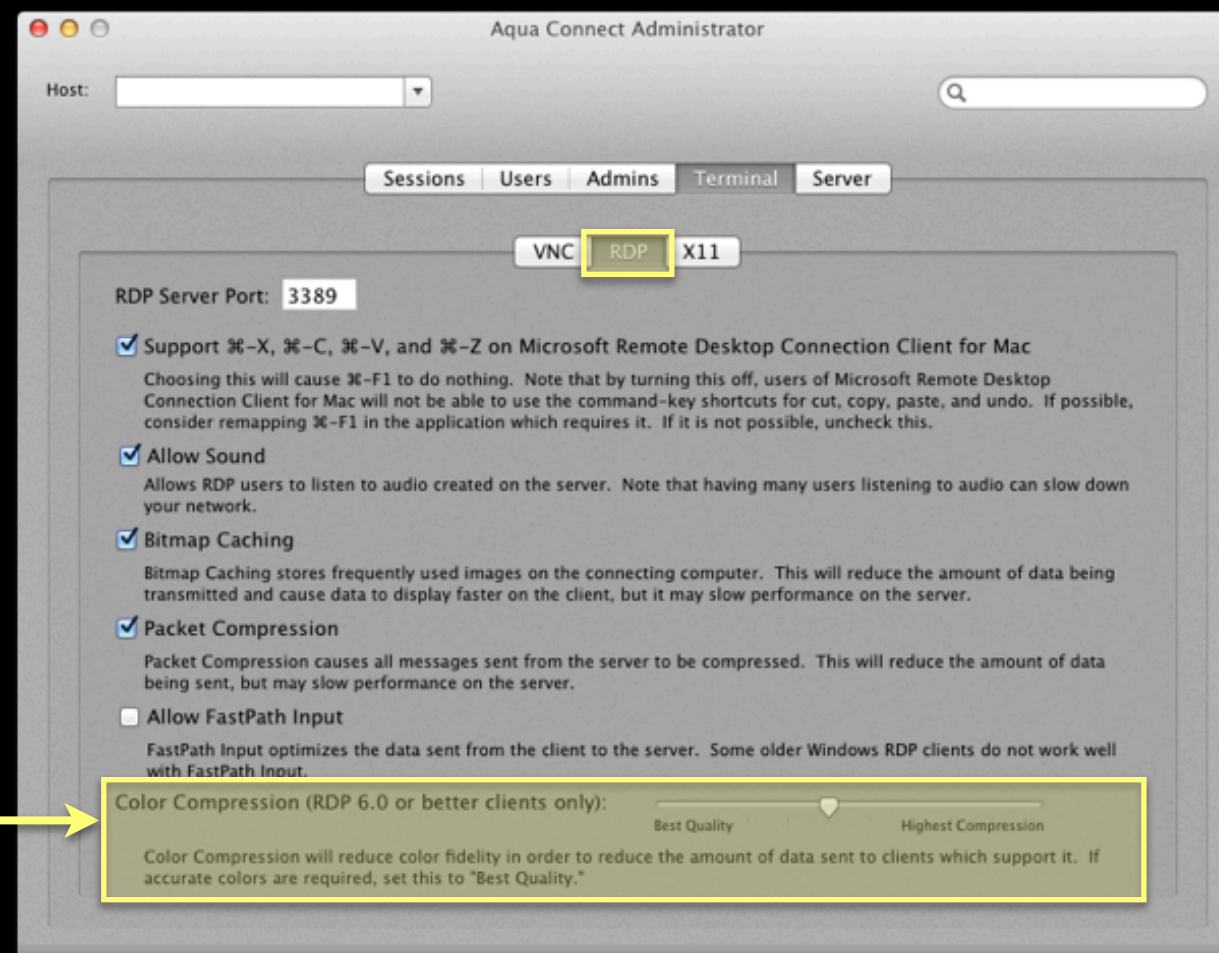
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Aqua Connect Remote Desktop Services Administration Tool

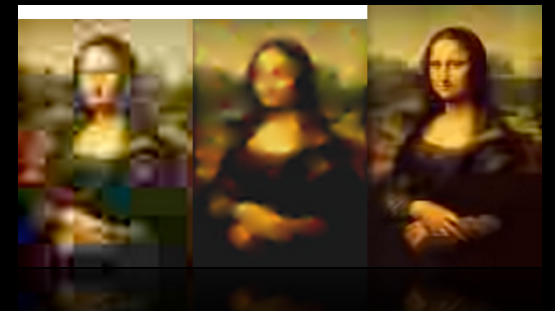


Terminal

- RDP Options:



Color Compression



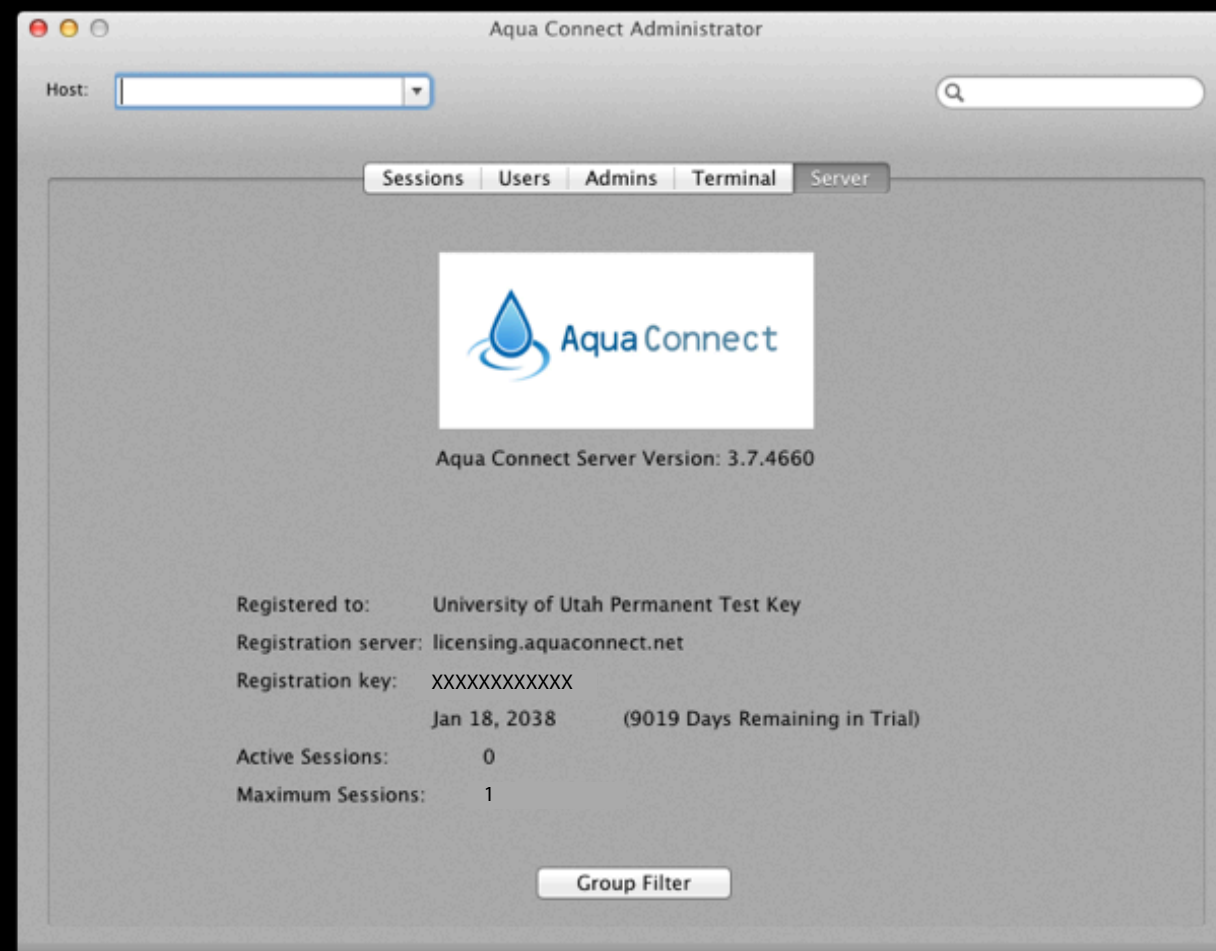
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Aqua Connect Remote Desktop Services Administration Tool



Server

- General about terminal server

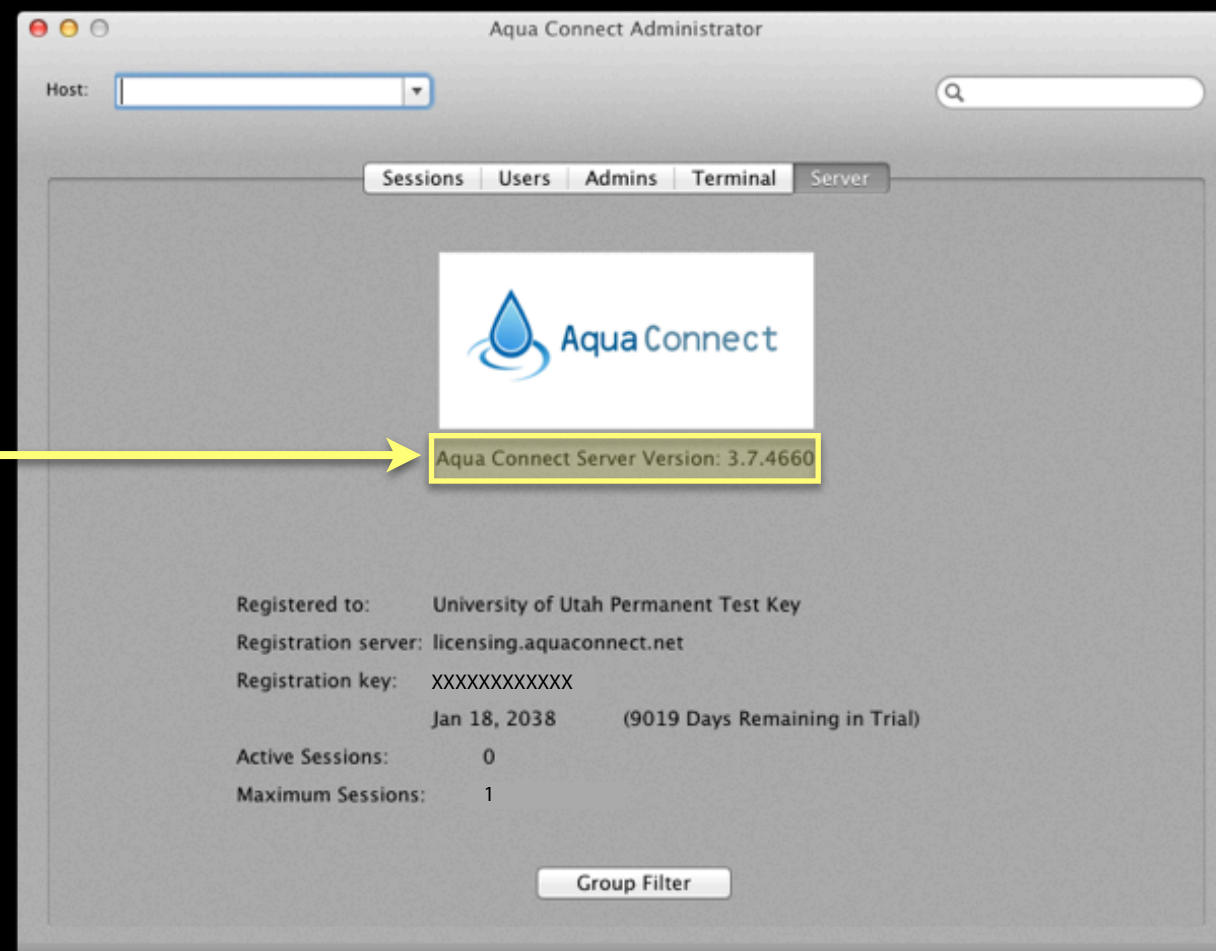


Aqua Connect Remote Desktop Services Administration Tool



Server

- General about terminal server



Aqua Connect Server Version



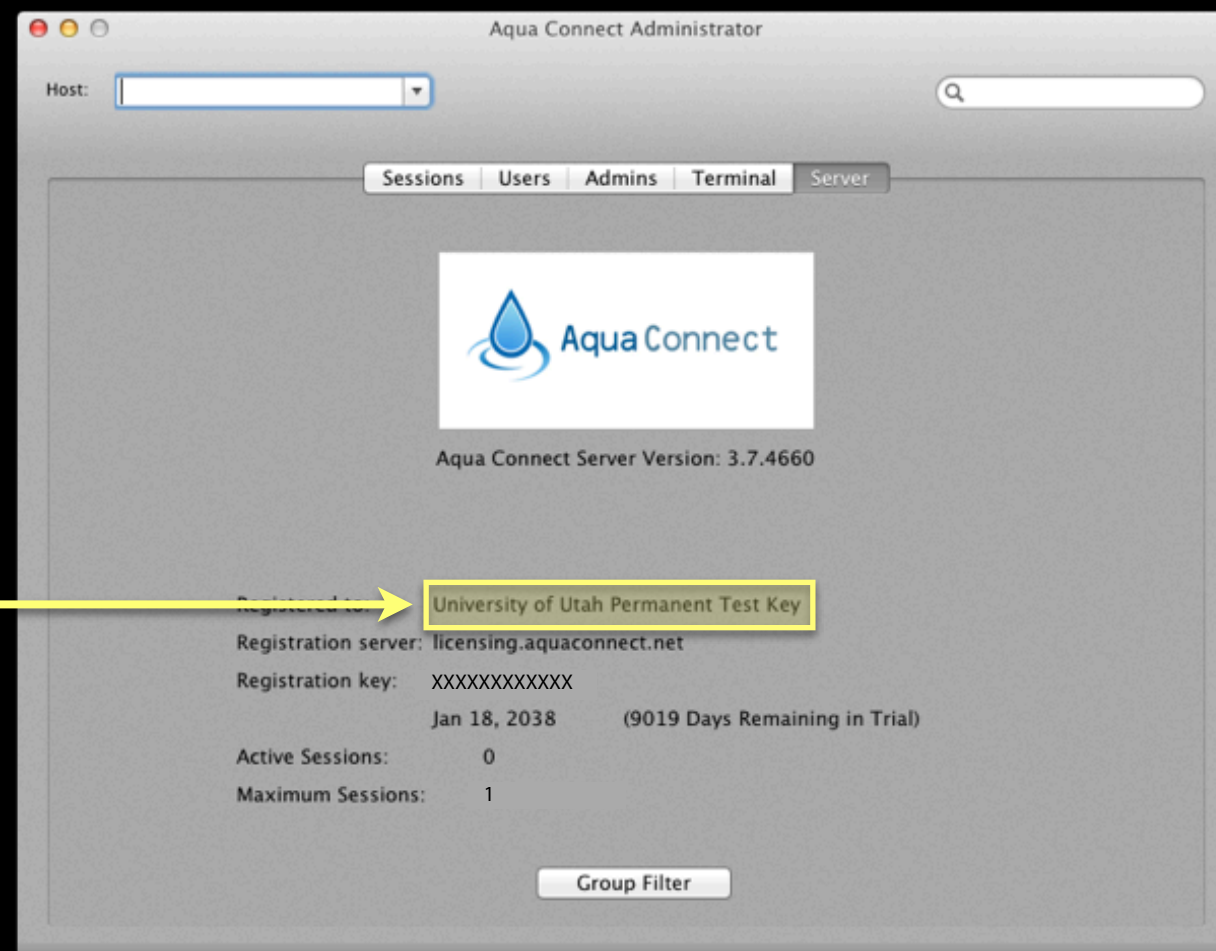
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Aqua Connect Remote Desktop Services Administration Tool



Server

- General about terminal server



Aqua Connect Remote Desktop Services Administration Tool



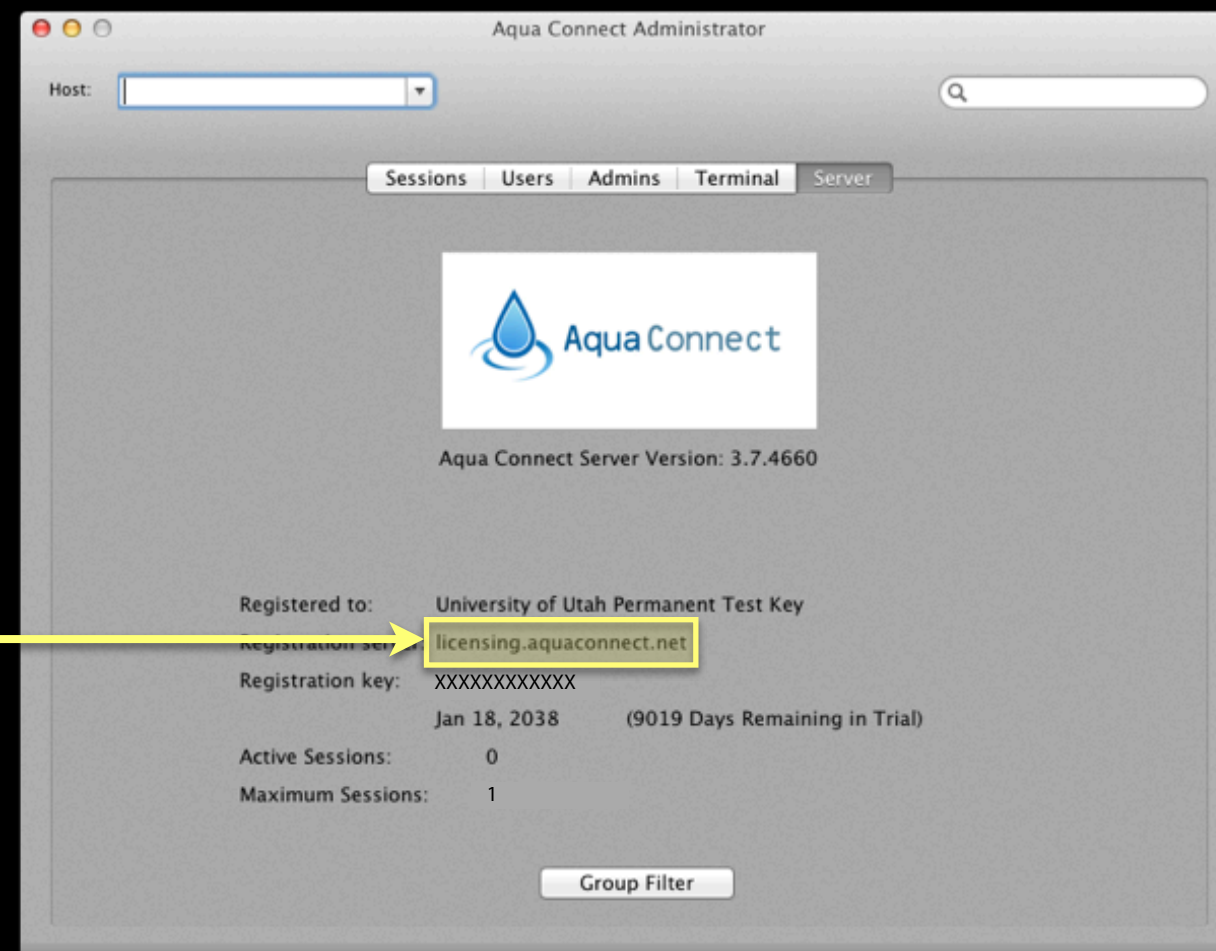
- General about terminal server

Note

Aqua Connect Server authenticates to the licensing server on every server boot or every 7 days.

Registration Server

Aqua Connect Registration Server

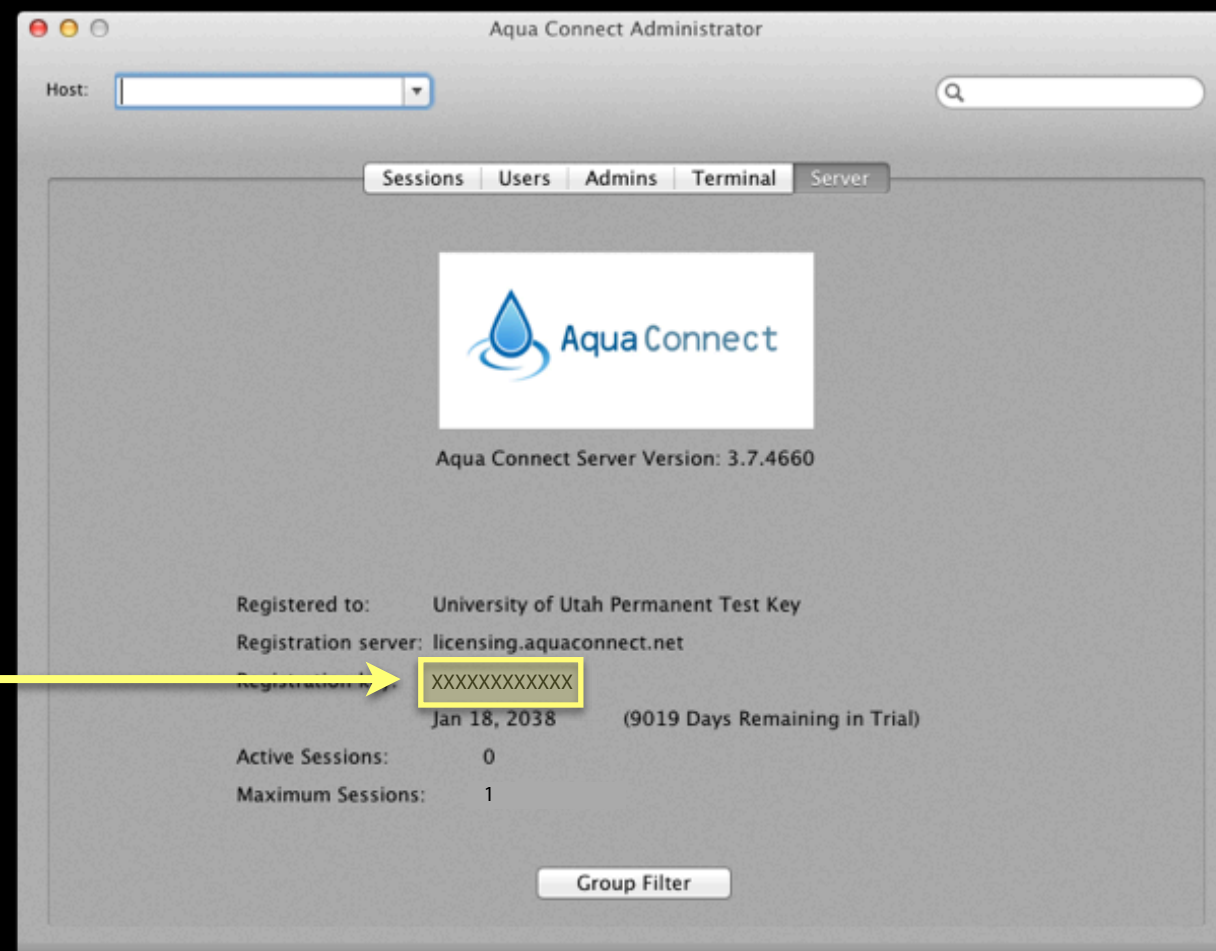


Aqua Connect Remote Desktop Services Administration Tool



Server

- General about terminal server



Registration Key
License assigned to server

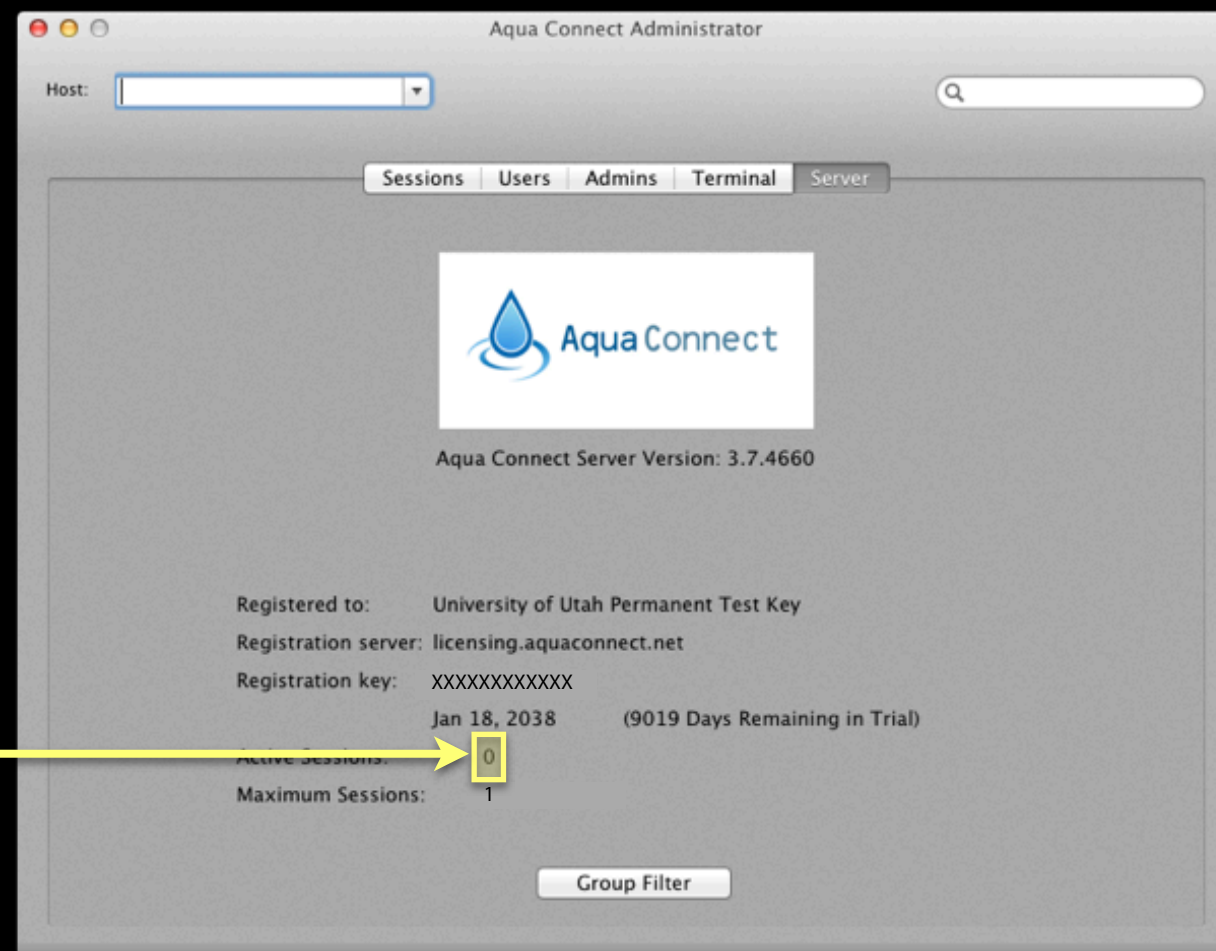


Aqua Connect Remote Desktop Services Administration Tool



Server

- General about terminal server



Active Sessions
Number of Currently Running Sessions

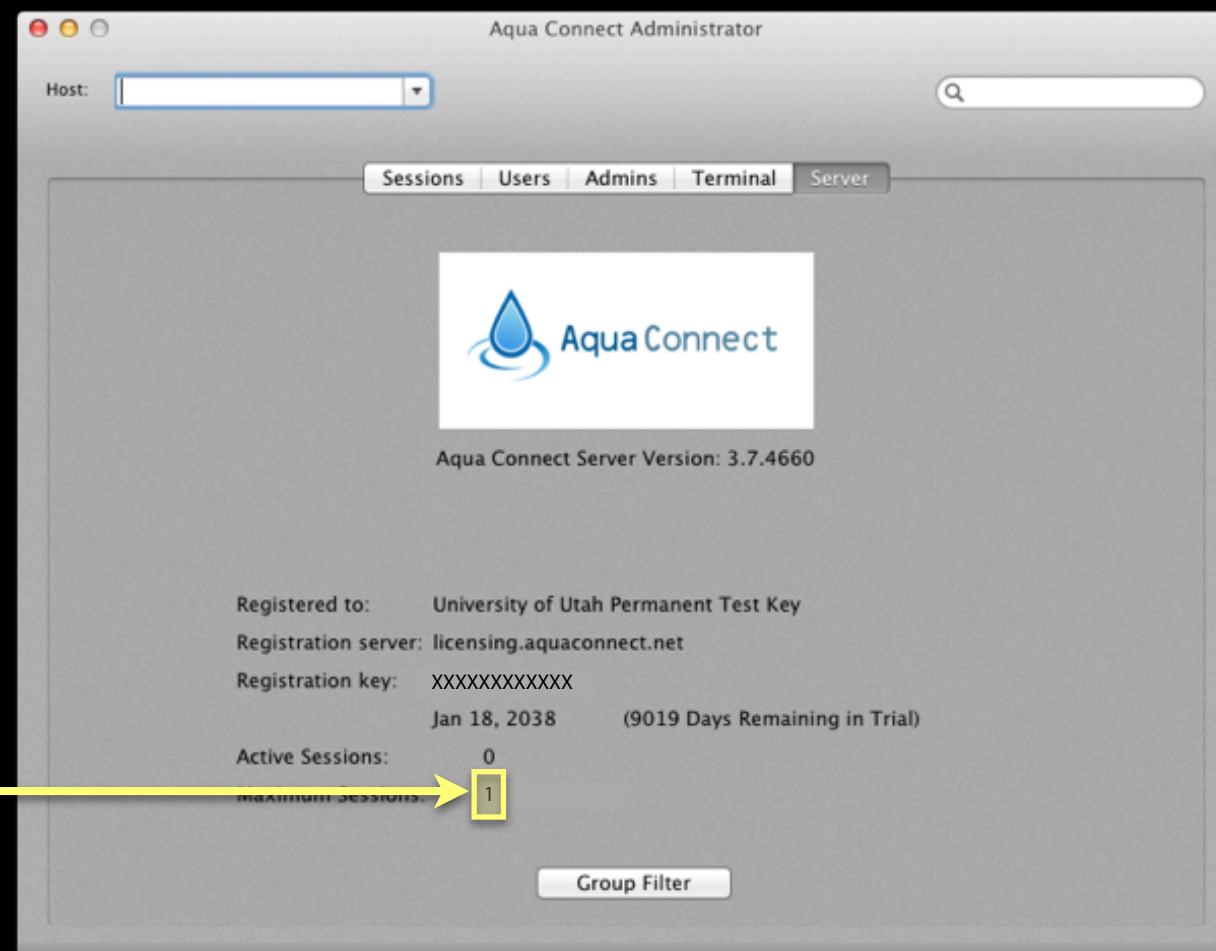


Aqua Connect Remote Desktop Services Administration Tool



Server

- General about terminal server



Maximum Sessions
Maximum Allowed Sessions for License

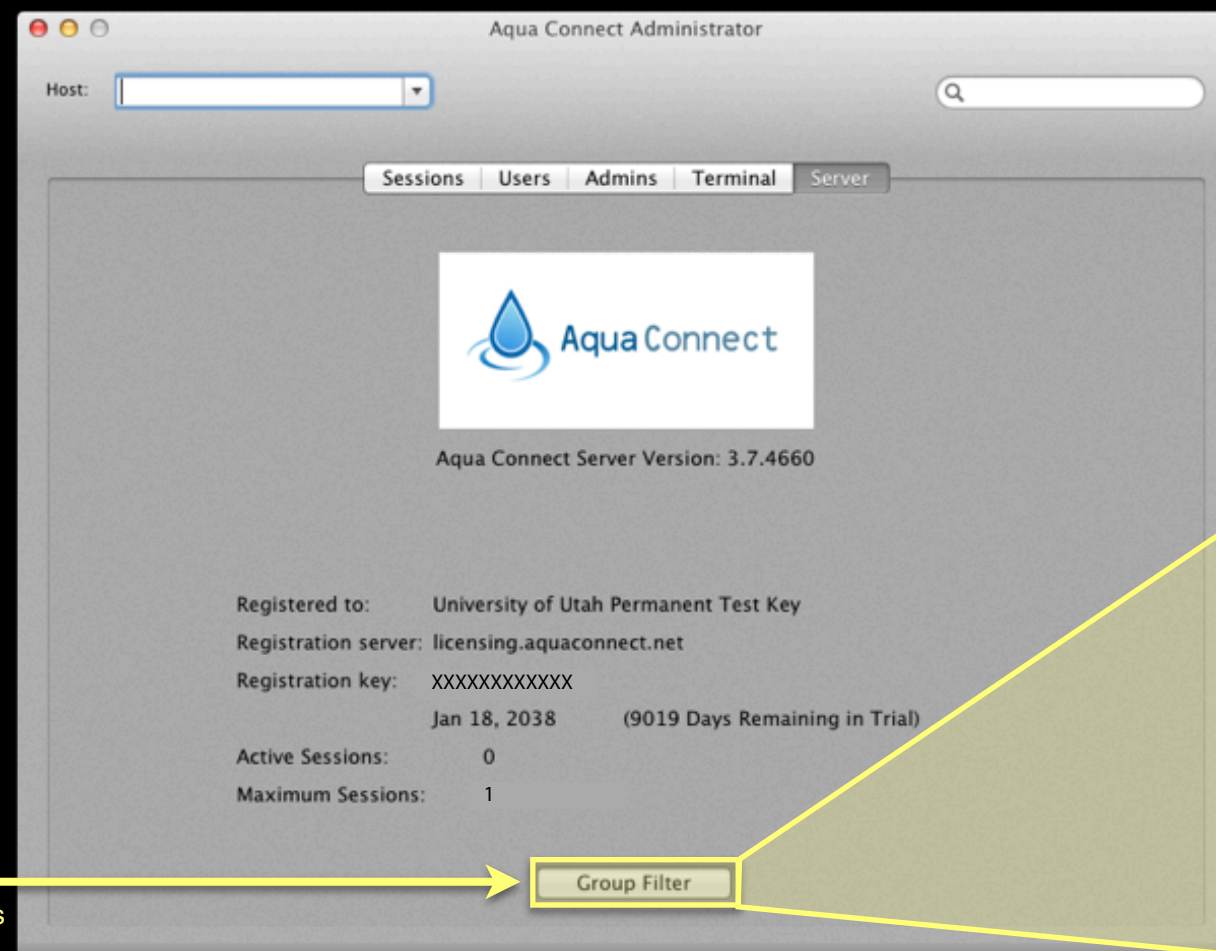


Aqua Connect Remote Desktop Services Administration Tool



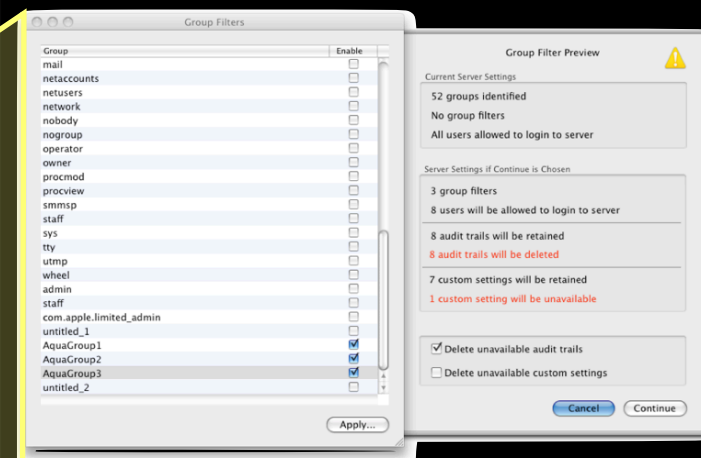
Server

- General about terminal server





Group Filter

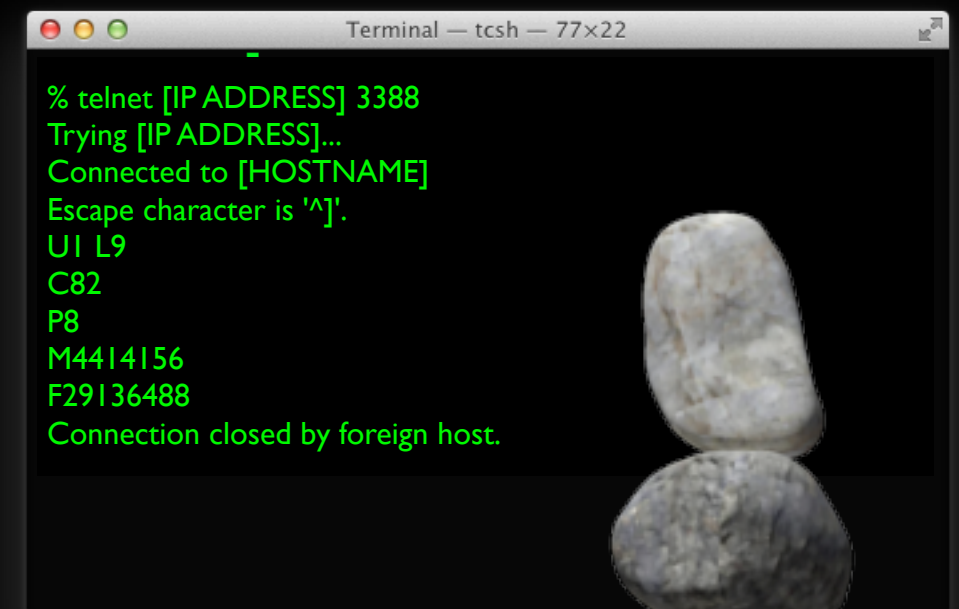
Allow Users Belonging to Enabled Groups
Login to Terminal server



J. Willard Marriott Library
THE UNIVERSITY OF UTAH

Aqua Connect Load Balancer

- Proxies all IP traffic for terminal server protocols
- Monitors terminal server(s) resources
 -  Available Licenses (L-U)
 -  CPU Load
 - Processor Cores Count
 - Used Memory
 - Free Memory
- Collects resources data every 10 minutes
- Routes connections to server with most available resources
- Only support RDP & AAP protocols



```
Terminal — tcsh — 77x22
% telnet [IP ADDRESS] 3388
Trying [IP ADDRESS]...
Connected to [HOSTNAME]
Escape character is '^'.
UI L9
C82
P8
M4414156
F29136488
Connection closed by foreign host.
```



Aqua Connect Load Balancer

- System Requirements



Hardware

- Can run on any Intel based Apple computer
- Recommend computer model w/network interface coprocessor



Operating System

- Apple Mac OS X 10.6, 10.7 or 10.8 (client or server)
- Mac OS X Server OS or application NOT required
- Upcoming release will support linux



Aqua Connect Load Balancer

- **ACLoadBalancer Tool.app - Admin Tool**

`/Applications/ACLoadBalancer Tool.app`

- Add/Remove Terminal Servers
- Enable/Disable Terminal Servers

- **ACTServer.list - Server Configuration**

`/private/etc/ACTServer.list`

- Add IP Address

```
echo "[IP ADDRESS]" >> /private/etc/ACTServer.list
```

- Remove IP Address

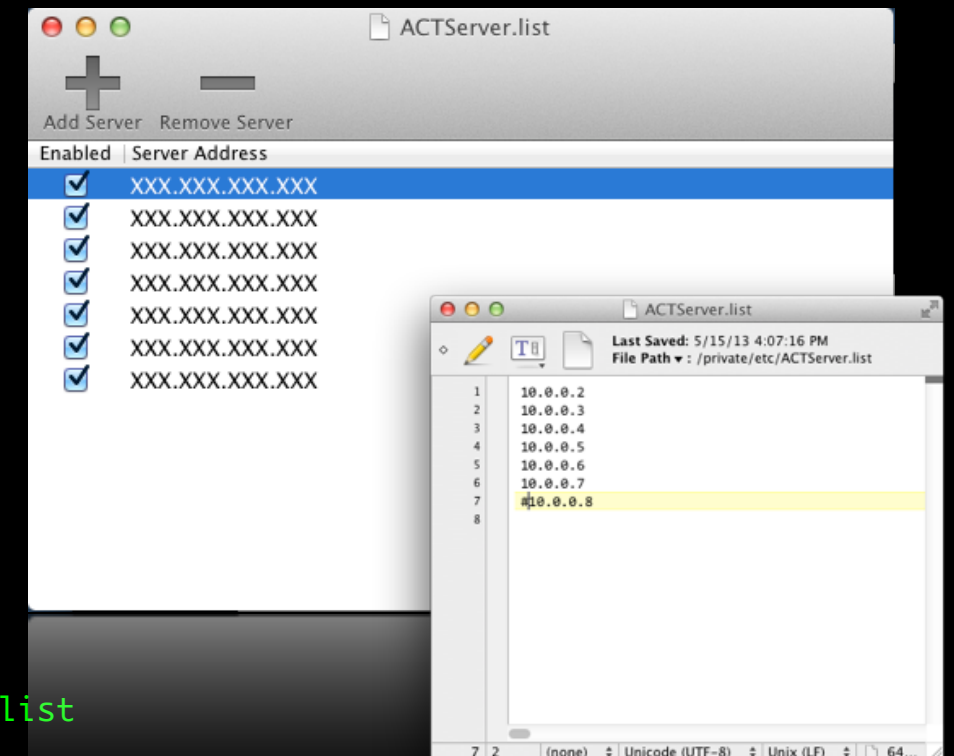
```
sed -i '.bak' "/^*[IP ADDRESS]*/d" /private/etc/ACTServer.list
```

- Enable IP Address

```
sed -i '.bak' "s/^*#[IP ADDRESS]/[IP ADDRESS]/g" /private/etc/ACTServer.list
```

- Disable IP Address

```
sed -i '.bak' "s/^*[IP ADDRESS]/#[IP ADDRESS]/g" /private/etc/ACTServer.list
```



Aqua Connect Load Balancer

- ACLoad - Binary

/Library/Application Support/ACTS/binary/ACLoad

- “Disabled” Key enabled on default installation

RDP Load Balancer

/Library/LaunchDaemons/net.aquaconnect.ACLoad.plist

AAP Load Balancer

/Library/LaunchDaemons/net.aquaconnect.ACLoadAAP.plist

Remove or Change Key



```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Disabled</key>
  <true/>
  <key>KeepAlive</key>
  <true/>
  <key>Label</key>
  <string>net.aquaconnect.ACLoad</string>
  <key>ProgramArguments</key>
  <array>
    <string>/Library/Application Support/ACTS/binary/ACLoad</string>
  </array>
</dict>
</plist>
```



Aqua Connect Load Balancer

- Troubleshooting Load Balancer

- Restart Load Balancer

Get Load Balancer Processes

```
ps aux | grep [A]CLoad
```

or

```
ps aux | grep ACLoad | grep -v grep
```

Get PID of Load Balancer Processes

```
ps aux | grep [A]CLoad | awk '{ print $2 }'
```

Terminate Processes - Send USR2 Signal

```
kill -USR2 $(ps aux | grep [A]CLoad | awk '{ print $2 }')
```

- Force Reloading Server List

Terminate Processes - Send USR1 Signal

```
kill -USR1 $(ps aux | grep [A]CLoad | awk '{ print $2 }')
```



Aqua Connect Time Out

- Aqua Connect Time Out (ACTO)
 - Software runs on ACRDS servers
 - Monitors Session Activity
 - Mouse Movement & Keyboard Activity
 - Disconnect Inactive Sessions After Specified Time
 - ACTO.app - Binary
`/Library/Application Support/ACTS/binary/ACTO.app`
 - ACTO.plist - Configuration File
`/etc/ACTO.plist`
 - net.aquaconnect.ACTO.plist - launchd item
`/Library/LaunchAgents/net.aquaconnect.ACTO.plist`



Aqua Connect Time Out

- Aqua Connect Time Out (ACTO)
 - ACTO.plist - Configuration File
`/etc/ACTO.plist`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Enabled</key>
  <true/>
  <key>Force</key>
  <false/>
  <key>MaxTimeInterval</key>
  <string>7200</string>
  <key>Method</key>
  <string>1</string>
  <key>TimerInterval</key>
  <string>60</string>
</dict>
</plist>
```


Aqua Connect Time Out

- Aqua Connect Time Out (ACTO)
 - ACTO.plist - Configuration File
`/etc/ACTO.plist`

Force
Not used

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Enabled</key>
  <true/>
  <key>Force</key>
  <false/>
  <key>MaxTimeInterval</key>
  <string>7200</string>
  <key>Method</key>
  <string>1</string>
  <key>TimerInterval</key>
  <string>60</string>
</dict>
</plist>
```



Aqua Connect Time Out

- Aqua Connect Time Out (ACTO)
 - ACTO.plist - Configuration File
`/etc/ACTO.plist`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Enabled</key>
  <true/>
  <key>Force</key>
  <false/>
  <key>MaxTimeInterval</key>
  <string>7200</string>
  <key>Method</key>
  <string>1</string>
  <key>TimerInterval</key>
  <string>60</string>
</dict>
</plist>
```

MaxTimeInterval

How long inactive session will last



Aqua Connect Time Out

- Aqua Connect Time Out (ACTO)
 - ACTO.plist - Configuration File
`/etc/ACTO.plist`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Enabled</key>
  <true/>
  <key>Force</key>
  <false/>
  <key>MaxTimeInterval</key>
  <string>7200</string>
  <key>Method</key>
  <string>1</string>
  <key>TimerInterval</key>
  <string>60</string>
</dict>
</plist>
```

7200 Seconds or 2 Hrs

Aqua Connect Time Out

- Aqua Connect Time Out (ACTO)
 - ACTO.plist - Configuration File
`/etc/ACTO.plist`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Enabled</key>
  <true/>
  <key>Force</key>
  <false/>
  <key>MaxTimeInterval</key>
  <string>7200</string>
  <key>Method</key>
  <string>1</string>
  <key>TimerInterval</key>
  <string>60</string>
</dict>
</plist>
```

Method

The method to end session



Aqua Connect Time Out

- Aqua Connect Time Out (ACTO)
 - ACTO.plist - Configuration File
`/etc/ACTO.plist`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Enabled</key>
  <true/>
  <key>Force</key>
  <false/>
  <key>MaxTimeInterval</key>
  <string>7200</string>
  <key>Method</key>
  <string>0</string>
  <key>TimerInterval</key>
  <string>60</string>
</dict>
</plist>
```

0 - Logout With Prompt

0 = Log the user out in a fashion similar to clicking "Log Out..." in the Apple menu. This displays a count down timer as well as give (an) application(s) the ability to abort the logout process if there is unsaved work.



Aqua Connect Time Out

- Aqua Connect Time Out (ACTO)
 - ACTO.plist - Configuration File
`/etc/ACTO.plist`

I - Logout Without Prompt

I = Log the user out without prompting the user or giving (an) application(s) the ability to abort the logout process - Typically combined with "Force" this will guarantee the session termination.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Enabled</key>
  <true/>
  <key>Force</key>
  <false/>
  <key>MaxTimeInterval</key>
  <string>7200</string>
  <key>Method</key>
  <string>1</string>
  <key>TimerInterval</key>
  <string>60</string>
</dict>
</plist>
```



Aqua Connect Time Out

- Aqua Connect Time Out (ACTO)
 - ACTO.plist - Configuration File
`/etc/ACTO.plist`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Enabled</key>
  <true/>
  <key>Force</key>
  <false/>
  <key>MaxTimeInterval</key>
  <string>7200</string>
  <key>Method</key>
  <string>2</string>
  <key>TimerInterval</key>
  <string>60</string>
</dict>
</plist>
```

2 - Lock Screen

2 = Lock the screen with a screen saver type of lock (no animation just blank screen with lock prompt)



Monitoring



Monitoring



Monitoring Aqua Connect Remote Desktop Server

```
# Monitor if RDP services are running on Aqua Connect Remote Desktop Server
```

```
export CHECK0="`ps ax -o command | grep WindowServer | grep -v grep | wc -l`"  
export CHECK1="`ps ax -o command | grep ACSM | grep -v grep | wc -l`"  
export CHECK2="`ps ax -o command | grep ACSEC | grep -v grep | wc -l`"  
export CHECK3="`ps ax -o command | grep ACGC | grep -v grep | wc -l`"  
export CHECK4="`ps ax -o command | grep CoreVideo | grep -v grep | wc -l`"  
export CHECK5="`ps ax -o command | grep ServiceManager | grep -v grep | wc -l`"  
export CHECK6="`ps ax -o command | grep ACRDPi | grep -v grep | wc -l`"
```

```
# Critical Checks
```

```
if [ $CHECK0 -lt 1 ]; then exit 2; fi  
if [ $CHECK1 -lt 1 ]; then exit 2; fi  
if [ $CHECK2 -lt 1 ]; then exit 2; fi  
if [ $CHECK3 -lt 1 ]; then exit 2; fi  
if [ $CHECK4 -lt 1 ]; then exit 2; fi  
if [ $CHECK6 -lt 1 ]; then exit 2; fi
```

```
# Warning Checks
```

```
if [ $CHECK5 -lt 1 ]; then exit 1; fi
```

```
exit 0;
```

Monitoring



Monitoring Aqua Connect Remote Desktop Server

Monitor if AAP services are running on Aqua Connect Remote Desktop Server

```
export CHECK0="`ps ax -o command | grep WindowServer | grep -v grep | wc -l`"
export CHECK1="`ps ax -o command | grep ACSM | grep -v grep | wc -l`"
export CHECK2="`ps ax -o command | grep ACSEC | grep -v grep | wc -l`"
export CHECK3="`ps ax -o command | grep ACGC | grep -v grep | wc -l`"
export CHECK4="`ps ax -o command | grep CoreVideo | grep -v grep | wc -l`"
export CHECK5="`ps ax -o command | grep ServiceManager | grep -v grep | wc -l`"
export CHECK6="`ps ax -o command | grep AAP | grep "Server -4" | grep -v grep | wc -l`"
export CHECK7="`ps ax -o command | grep AAP | grep PrintServer | grep -v grep | wc -l`"
```

Critical Checks

```
if [ $CHECK0 -lt 1 ]; then exit 2; fi
if [ $CHECK1 -lt 1 ]; then exit 2; fi
if [ $CHECK2 -lt 1 ]; then exit 2; fi
if [ $CHECK3 -lt 1 ]; then exit 2; fi
if [ $CHECK4 -lt 1 ]; then exit 2; fi
if [ $CHECK6 -lt 1 ]; then exit 2; fi
```

Warning Checks

```
if [ $CHECK5 -lt 1 ]; then exit 1; fi
if [ $CHECK7 -lt 1 ]; then exit 1; fi
```

```
exit 0;
```

Monitoring

- Monitoring Aqua Connect Remote Desktop Server
- Nagios Plugin - check_x224
http://exchange.nagios.org/directory/Plugins/Remote-Access/check_x224/details
- Checks that the most basic parts of a RDP connection succeeds

The screenshot shows the Nagios Exchange website interface. At the top, there is a navigation bar with links: Network, Enterprise, Support, Library, Project, Exchange, and a plus sign. The main header features the Nagios logo and the word "Exchange" with the tagline "Fill Your Nagios Toolbox". Below the header is a secondary navigation bar with links: Home, Directory, and About. The main content area displays the details for the "check_x224" plugin, which is marked as "Featured". It includes a "SHARE" button, a "Submit review" button, and a "Recommend" button. The plugin has a rating of 4.5 stars (14 votes) and is favoured by 1 user. The owner is listed as "tarvin" and the website is "troels.arvin.dk/code/nagios/check_x224". The number of hits is 65383. On the right side, there is a "Search Exchange" section with a search bar and a "Search" button, and a "Search All Sites" section with a search bar and a "Go" button. At the bottom right, there is a "Contact Us" section with the phone number 1-888-NAGIOS-1 and the email address sales@nagios.com.

Network: | Enterprise | Support | Library | Project | Exchange | [+]

Nagios® Exchange
Fill Your Nagios Toolbox

Home | Directory | About

Home | Directory | Plugins | Remote Access | check_x224

check_x224 Featured

SHARE

Submit review | Recommend | Print | Visit

Rating: ★★★★★ 14 votes Favoured: 1

Owner: tarvin

Website: troels.arvin.dk/code/nagios/check_x224

Hits: 65383

Files: File Description

Search Exchange

search...
Search
Advanced Search

Search All Sites

Go

Contact Us
Phone: 1-888-NAGIOS-1
Email: sales@nagios.com

Client Software

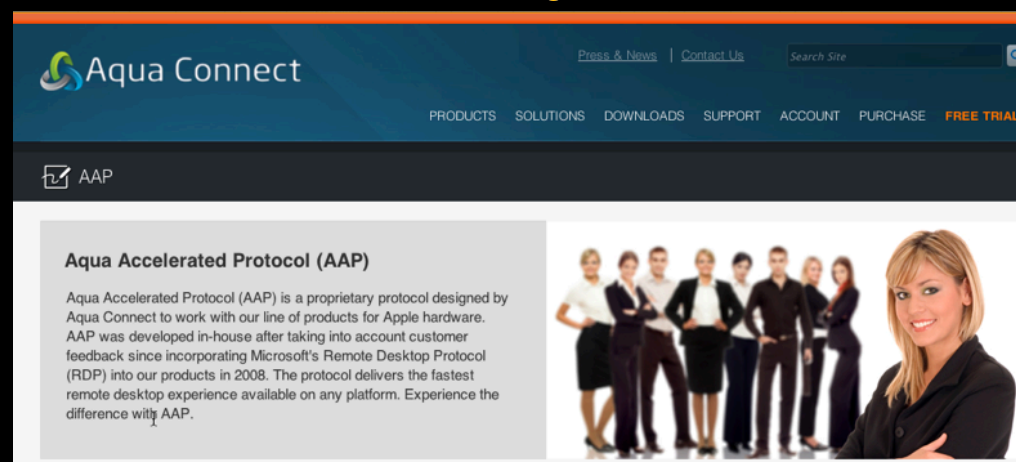
Overview



AAP Client

Aqua Accelerated Protocol Client [AAP]

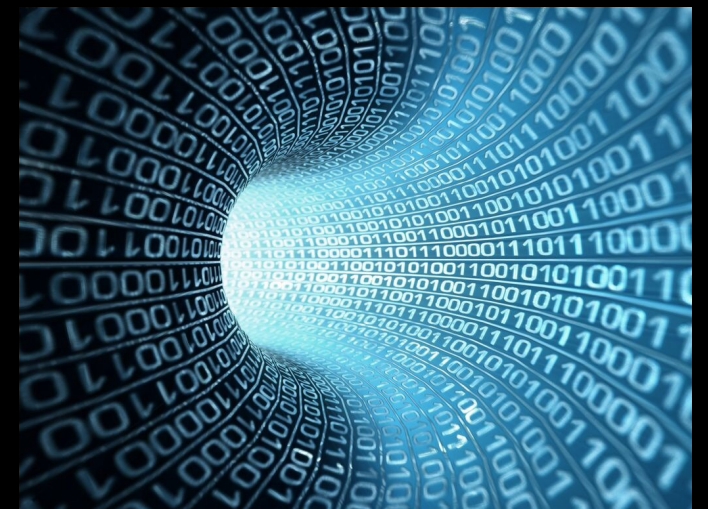
- OS X & Windows available from Aqua Connect:
<http://www.aquaconnect.net/downloads/>
- In development...
 - iOS , HTML 5, Chrome OS, Linux, & Android
 - iOS (almost done, June)
 - HTML 5/Chrome OS (July)
 - Linux (July)
 - Android (Q4 2013)



Aqua Accelerated Protocol

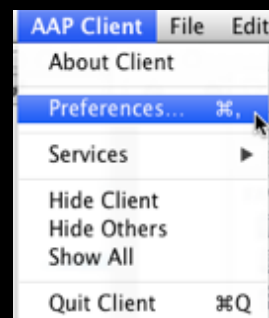
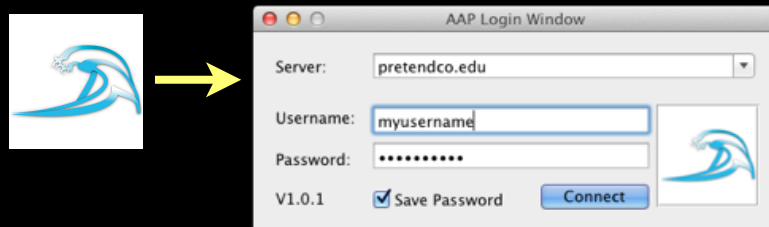
Aqua Accelerated Protocol [AAP] <http://www.aquaconnect.net/aap>

- Proprietary protocol designed by Aqua Connect
- AAP Default Port is 310 TCP (port can be changed)
- 2 to 1 data savings over VNC
- 10 to 1 data savings over RDP w/o Audio
- 5 to 1 data savings over RDP w/Audio
- Full motion 1080p video at less than 1 Mbps
- Note - It's still in development but looking very promising!!!



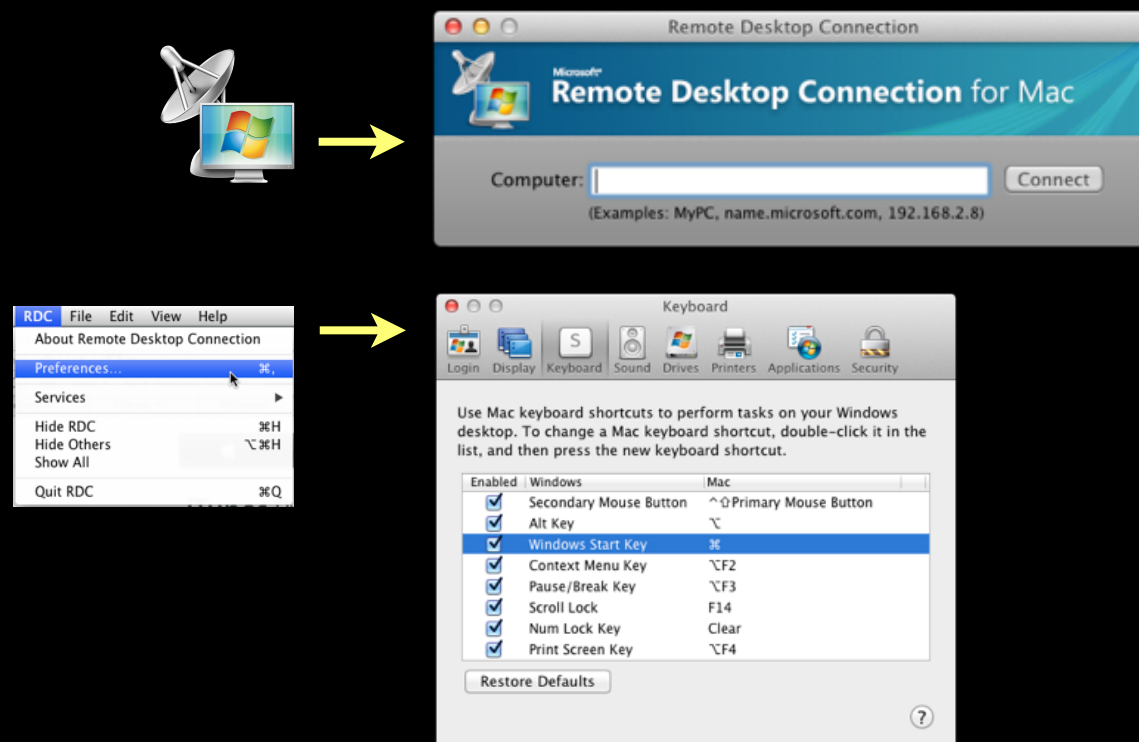
Aqua Accelerated Protocol Client

Aqua Accelerated Protocol Client [AAP]



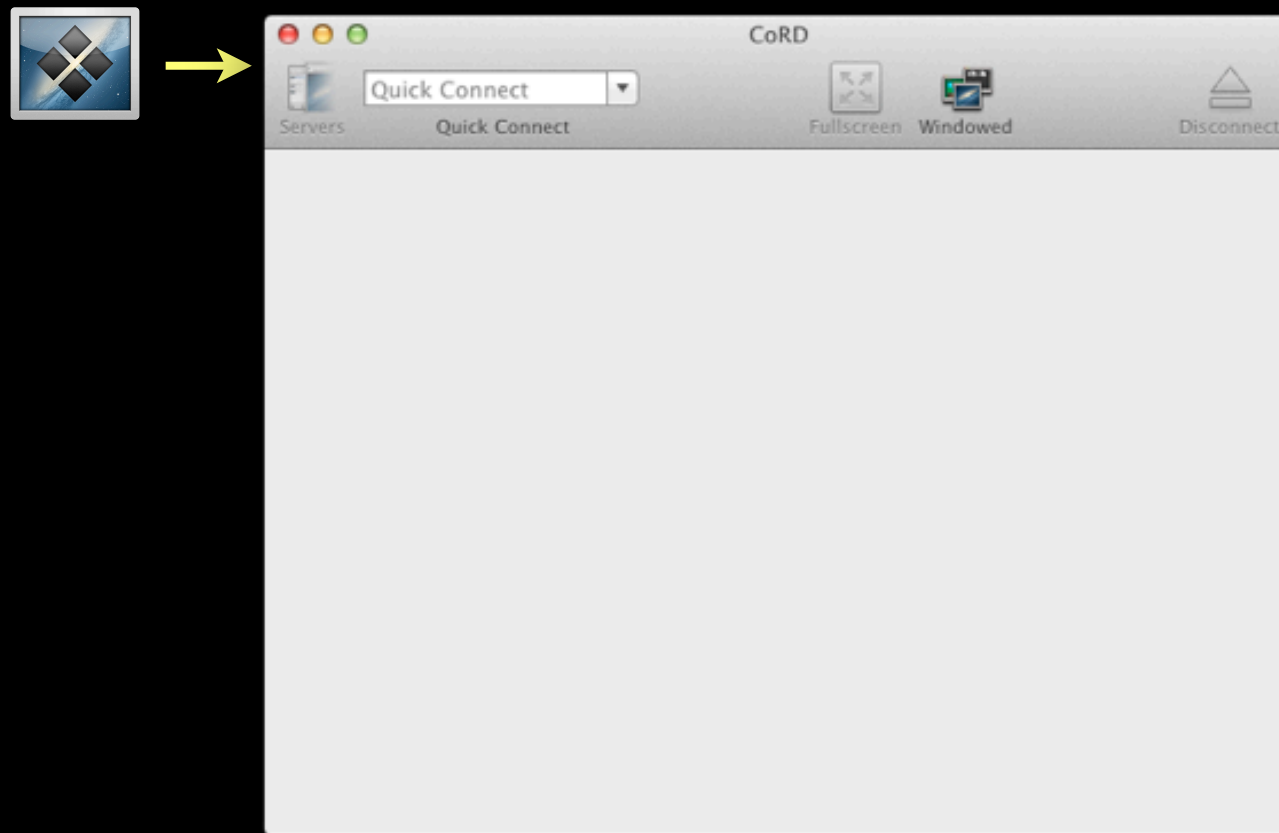
Remote Desktop Protocol Client

- Remote Desktop Protocol Client [RDP]
 - Microsoft Remote Desktop Connection for Mac for OS X
<http://www.microsoft.com/en-us/download/details.aspx?id=18140>



Remote Desktop Protocol Client

- Remote Desktop Protocol Client [RDP]
 - CoRD for OS X
<http://cord.sourceforge.net>



Remote Desktop Protocol Client

- Remote Desktop Protocol Client [RDP]
 - Jump for iOS
<https://itunes.apple.com/us/app/jump-desktop-remote-desktop/id364876095?mt=8>



iTunes Preview

What's New What is iTunes iTunes Charts

Jump Desktop (Remote Desktop) – RDP / VNC

By Phase Five Systems

Open iTunes to buy and download apps.

Description
"Best App for Remote Desktop control"
... O'Reilly's "Best iPhone Apps"

Phase Five Systems Web Site **Jump Desktop (Remote Desktop) – RDP / VNC Support** ...More

What's New in Version 5.0.2
RDP Fixes:
* Auto correction and dictation fixes
* Can not connect to load balanced servers ...More

Screenshots

iPhone | iPad

View In iTunes

This app is designed for both iPhone and iPad

\$14.99
Category: Business
Updated: Nov 15, 2012
Version: 5.0.2
Size: 10.0 MB
Seller: PhaseFive Systems
© Phase Five Systems
Rated 4+

Requirements: Compatible with iPhone, iPod touch, and iPad.



Licensing



"Funny, really. They always click on 'install' without reading the license agreement."

without reading the license agreement."
"Funny, really. They always click on 'install'.

EULA

- **End-User License Agreement**

An **end-user license agreement** or **software license agreement** is the contract between the licensor and purchaser, establishing the purchaser's right to use the operating system or software.

- OS X Terminal Services

- Remote Desktop - OS X Client/Server
- Published Software



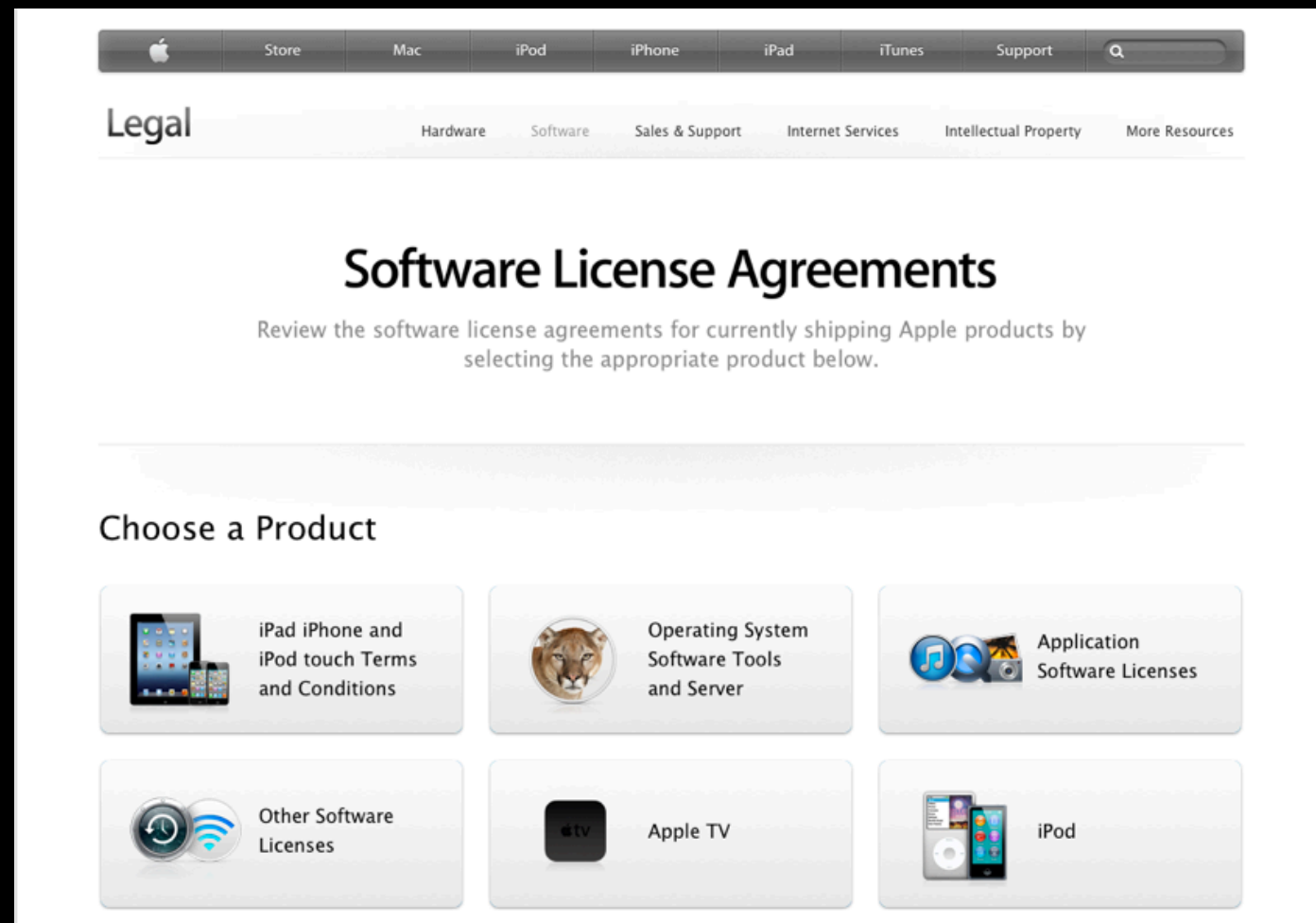
- Verify use meets EULA with company representatives
- Consult legal resources if needed or you have any doubts
- Note - I am not qualified to give legal advice & have no legal expertise
- This is simply an overview of Apple EULA's



EULA - Apple

- Apple Software License Agreements

<http://www.apple.com/legal/sla/>



EULA - Apple

- OS X must run on Apple-branded computer

Mac OS X 10.6 (Snow Leopard)

<http://www.apple.com/legal/sla/docs/macosx106.pdf>

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<http://www.apple.com/legal/sla/docs/macosx1073.pdf>

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Mac OS X 10.6 Server (Snow Leopard)

http://www.apple.com/legal/sla/docs/osx_snow_leopard_server_sec_upd.pdf

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Mac OS X 10.7.3 Server (Lion)

http://www.apple.com/legal/sla/docs/osx_lion_server_sec_upd.pdf

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Mac OS X 10.8 Server (Mountain Lion) - OS X Server 2.0

<http://www.apple.com/legal/sla/docs/OSXServer.pdf>

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Mac OS X 10.8 Server (Mountain Lion) - OS X Server 2.2

<http://www.apple.com/legal/sla/docs/OSXServer22.pdf>

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OS X Must Run on Apple-Branded Hardware

- Can NOT legally run OS X locally on non-Apple Hardware



Pystar

http://en.wikipedia.org/wiki/Psystar_Corporation



Data Center Non-Apple Hardware

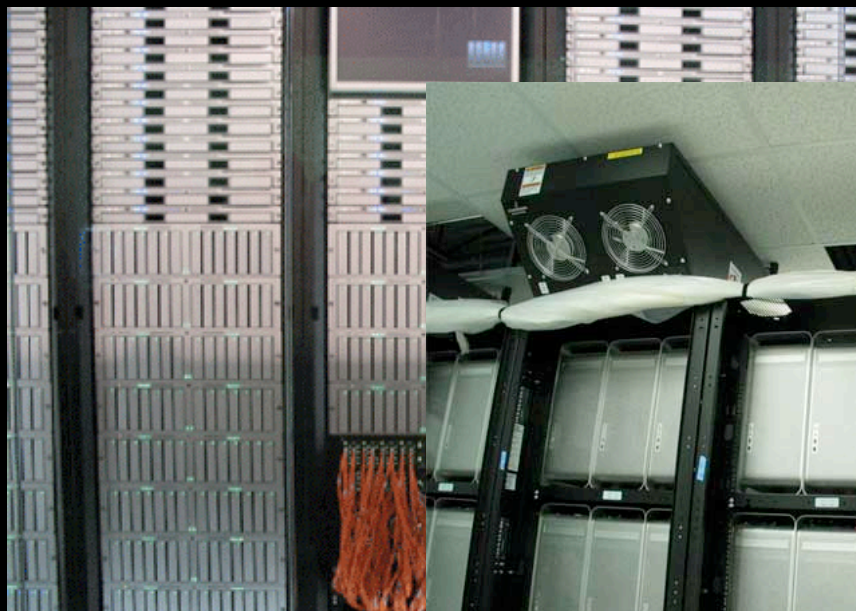


EULA - Apple



OS X Must Run on Apple-Branded Hardware

- But, can legally run OS X locally on Apple hardware



Xserve



Mac Pro

<http://www.activatethespace.com/cadlock.html>



Mac mini

<http://www.h-sq.com/products/minirack/>



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- Remote session can be from any type of computer or device

Mac OS X 10.8 (Mountain Lion) - Section G

<http://www.apple.com/legal/sla/docs/OSX1082.pdf>

Mac OS X 10.8 Server (Mountain Lion)

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EULA - Apple

- Remote session can be from any type of computer or device

Mac OS X 10.7 (Lion) - Section G

<http://www.apple.com/legal/sla/docs/macosx1073.pdf>

Mac OS X 10.7 Server (Lion) - Section H

http://www.apple.com/legal/sla/docs/osx_lion_server_sec_upd.pdf

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EULA - Apple

- Remote session can be from any type of computer or device
 - Any platform, thin client or other device



EULA - Apple

- **Only One Remote Control Graphical Desktop Session**

Mac OS X 10.8 (Mountain Lion) - Section G

<http://www.apple.com/legal/sla/docs/OSX1082.pdf>

Mac OS X 10.8 Server (Mountain Lion)

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EULA - Apple

- **Only One Remote Control Graphical Desktop Session**

Mac OS X 10.7 (Lion) - Section G

<http://www.apple.com/legal/sla/docs/macosx1073.pdf>

Mac OS X 10.7 Server (Lion) - Section H

http://www.apple.com/legal/sla/docs/osx_lion_server_sec_upd.pdf

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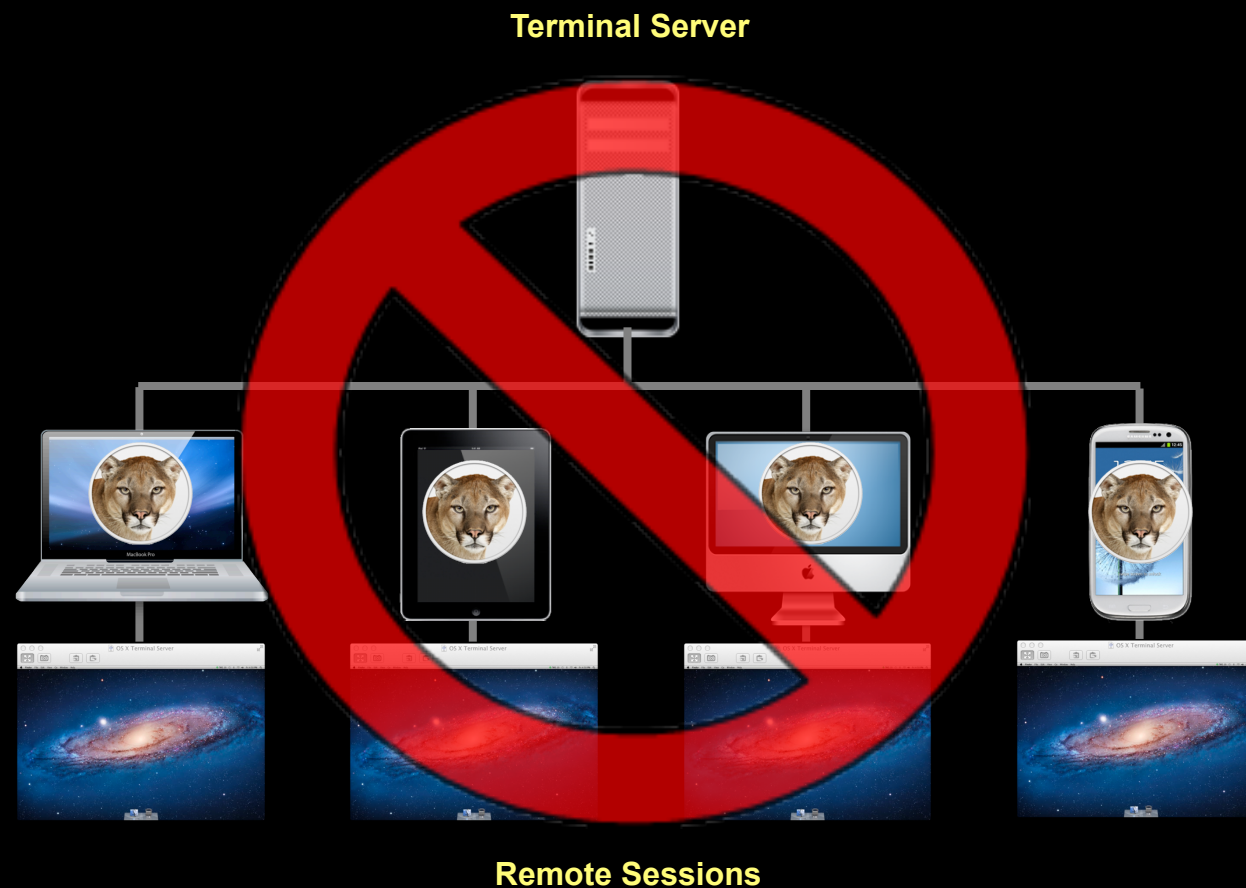
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Only One Remote Control Graphical Desktop Session

- Can NOT legally allow multiple remote control graphical sessions



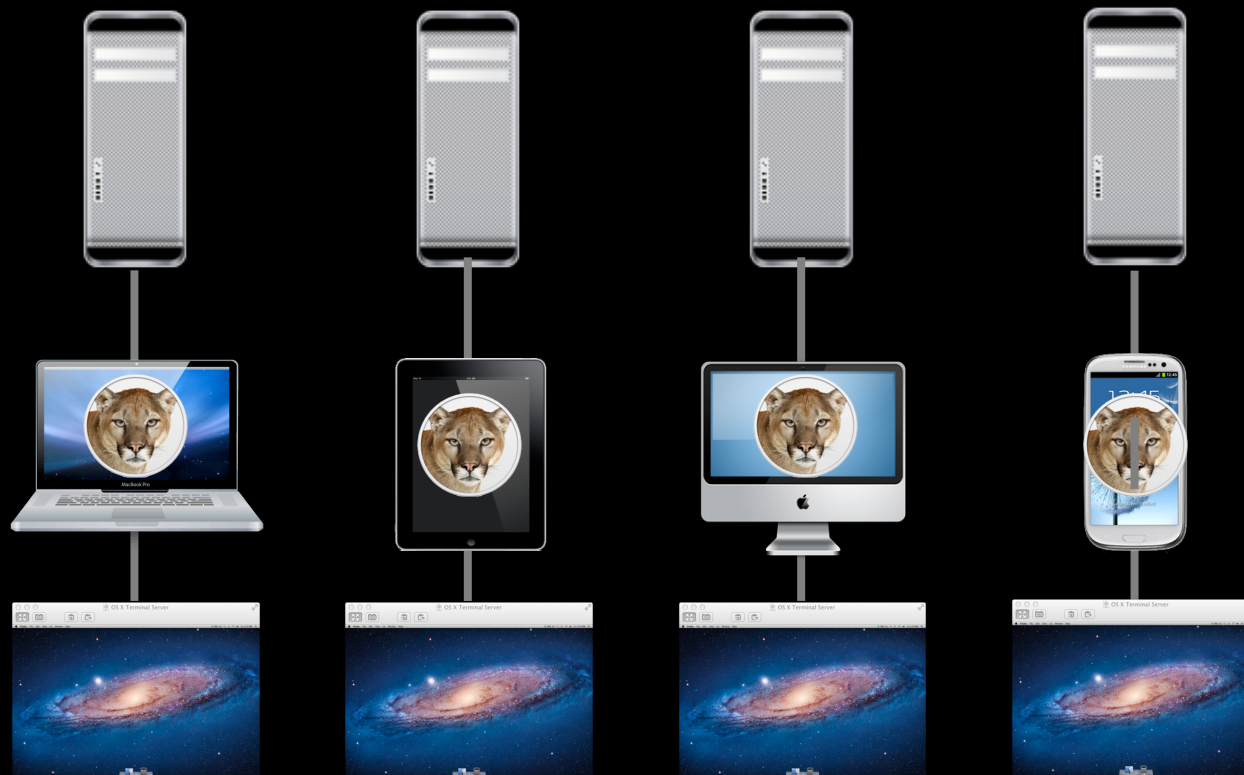
EULA - Apple



Only One Remote Control Graphical Desktop Session

- Only one-to-one relationship on remote control graphical sessions
- One Apple computer allows one remote control session

Terminal Server(s)



Remote Sessions

EULA - Apple

- Only One Remote Control Graphical Desktop Session

Mac OS X 10.6 (Snow Leopard)

<http://www.apple.com/legal/sla/docs/macosx106.pdf>

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Mac OS X 10.6 Server (Snow Leopard)

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- No specific mention of remote desktop restrictions

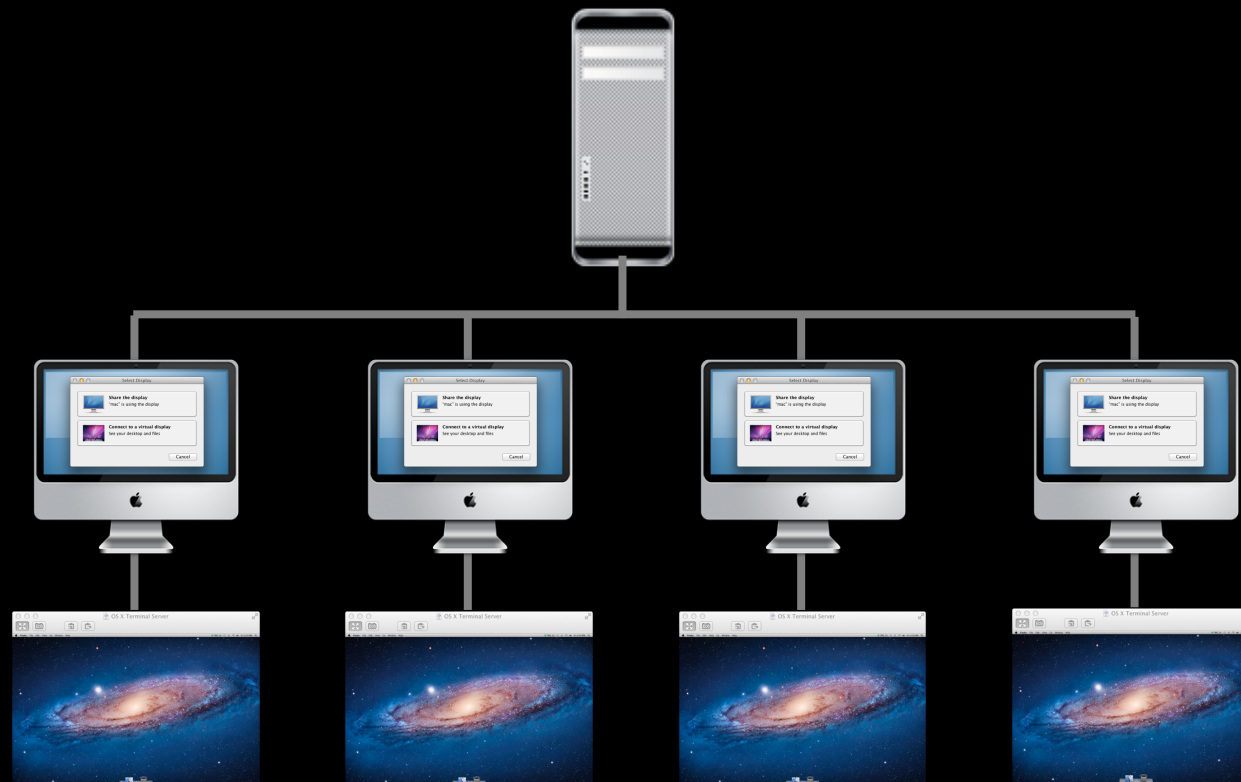


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OS X Built-In Screen Sharing Remote Multiple Sessions

- OS X 10.7 & OS X 10.8 built-in Screen Sharing
- Allows multiple remote control desktop sessions



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- Clause - "except otherwise licensed by Apple"

Mac OS X 10.8 (Mountain Lion) - Section G

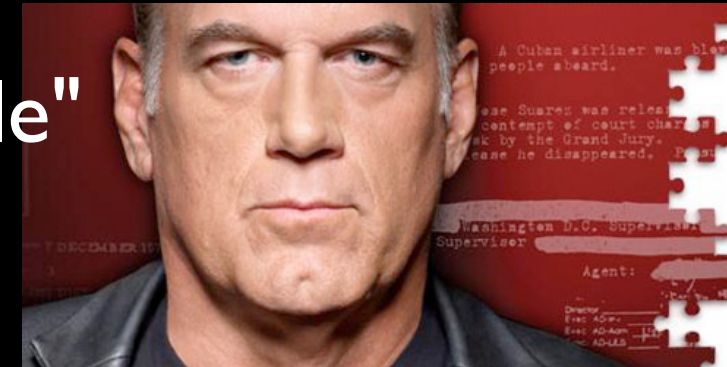
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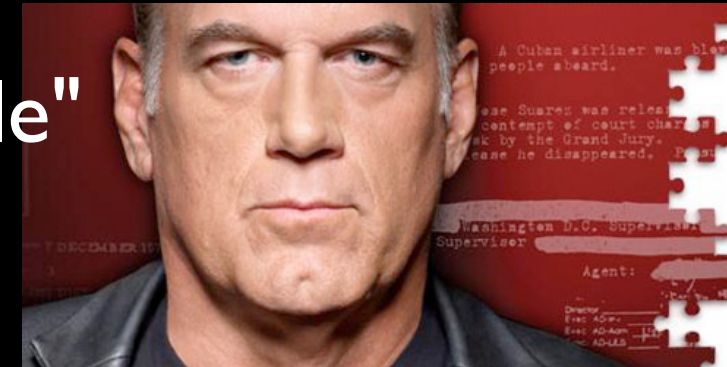
Mac OS X 10.7 Server (Lion) - Section H

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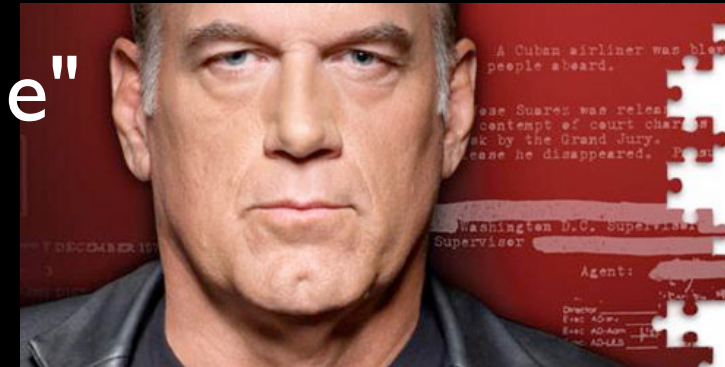
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- Clause - "except otherwise licensed by Apple"
 - Maybe, if you are a important or big enough account...
 - Apple might grant a license that allows specific EULA restrictions?



Future



Aqua Connect Developing Application Streaming

- Currently appears not prohibited under Apple OS EULA's
- Similar to Citrix XenApp but for OS X Apps
- 2 to 3 times improvement over “desktop streaming”

Terminal Server



Remote Sessions



Thanks

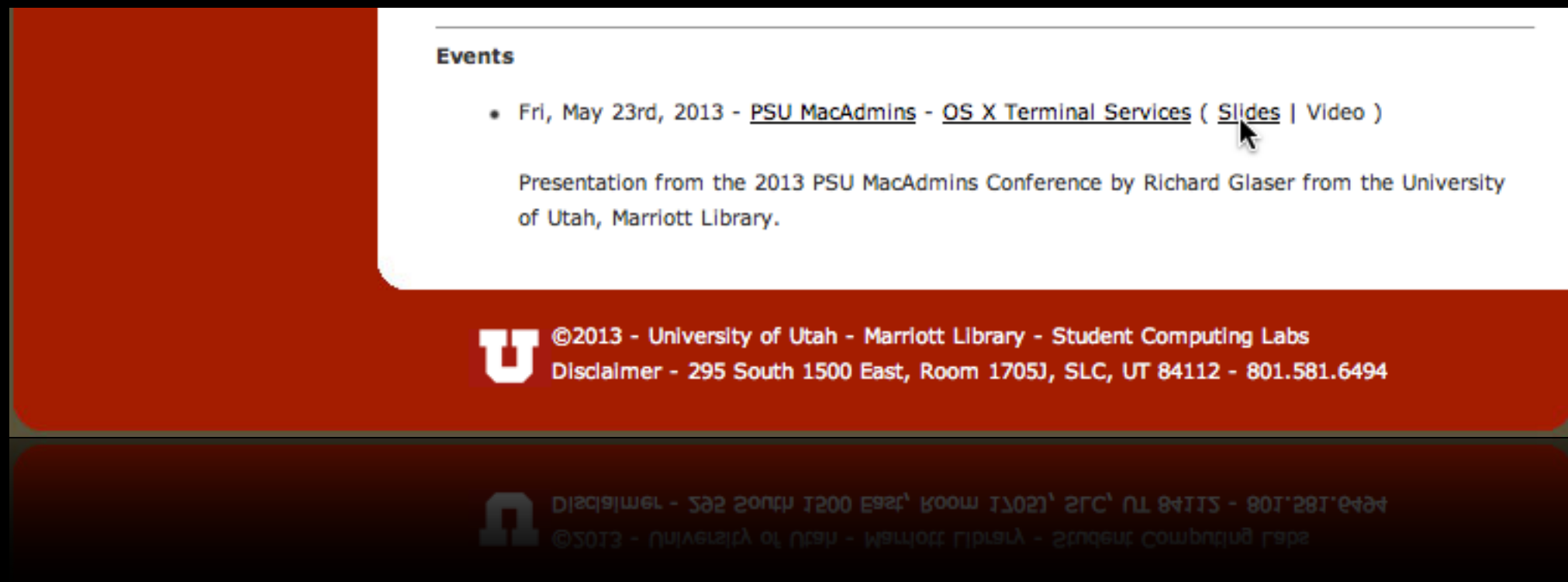
Thanks for attending the presentation



Slides

- Download slides from web site:

<http://www.mac-mgrs.utah.edu>




The screenshot shows a webpage with a white header area on the right and a red footer area. The header area contains the title "Events" and a list of events. The first event is "Fri, May 23rd, 2013 - PSU MacAdmins - OS X Terminal Services (Slides | Video)". Below the event list, there is a paragraph: "Presentation from the 2013 PSU MacAdmins Conference by Richard Glaser from the University of Utah, Marriott Library." The red footer area contains the University of Utah logo, the copyright notice "©2013 - University of Utah - Marriott Library - Student Computing Labs", and the disclaimer "Disclaimer - 295 South 1500 East, Room 1705J, SLC, UT 84112 - 801.581.6494".

Events

- Fri, May 23rd, 2013 - [PSU MacAdmins](#) - [OS X Terminal Services](#) ([Slides](#) | [Video](#))

Presentation from the 2013 PSU MacAdmins Conference by Richard Glaser from the University of Utah, Marriott Library.

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Contact

Contact Info:



Richard Glaser
University of Utah
Marriott Library, Room 5300F
295 South 1500 East
Salt Lake City, UT 84112-0860

`richard[dot]glaser[at]utah[dot]edu`



Q&A

- Any questions or answers?

