



Technical Computing in the New Hess Tower



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Hess Tower



-Worldwide headquarters of Hess Exploration and Production

-The building is 844,000 square feet and is located at 1501 McKinney Street in Houston's Discovery Green Park

-Hess Tower is a Platinum LEED certified structure

-Completed Summer 2011

LEED - Leadership in Energy and Environmental Design



- LEED certification provides independent verification that a building was designed and built using strategies aimed at achieving high performance in key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.
 - <http://www.usgbc.org/>
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Why LEED?



- Lower operating costs and increase asset value
 - Reduce waste sent to landfills
 - Conserve energy and water
 - Be healthier and safer for occupants
 - Reduce harmful emissions
 - Qualify for tax rebates, zoning allowances and other incentives
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Interesting Facts



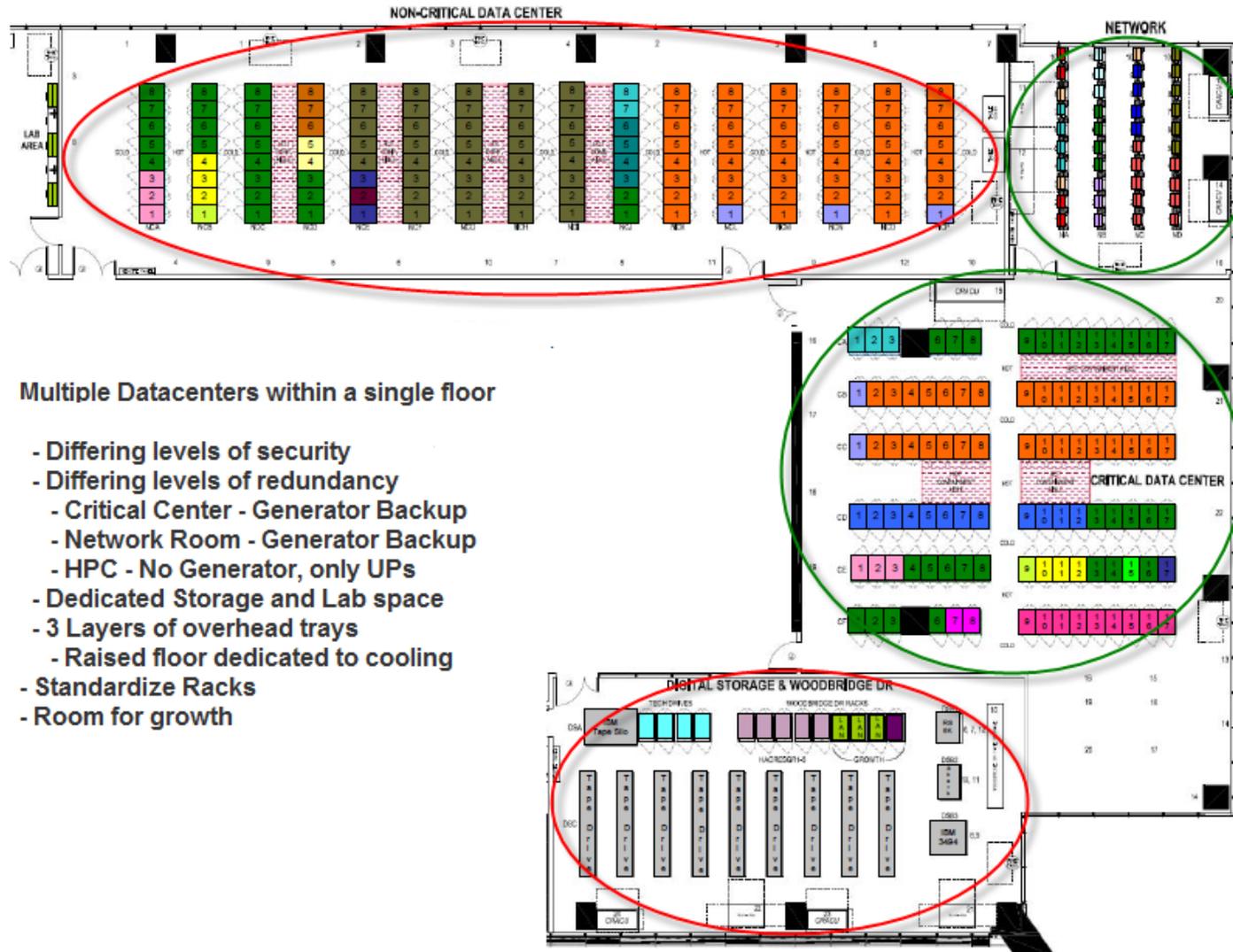
- 1.2 Million man-hours spent building the Hess Tower
 - Peak of 710 workers onsite
 - 161 miles of copper wire
 - 622 miles of Cat 6A Cabling for voice/data
 - 17860 Copper data connections
 - Even the window shades have IP addresses
 - 944 miles of Fiber optic cabling
 - 33 miles of Velcro
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Hess Tower Datacenters



- Multiple Datacenters, Single Floor
 - 650 Tons A/C, 9 500 KVA UPS, 3 Generators
 - Different rooms with different characteristics
 - Off the shelf and standard components (racks, pdus, trays, shelves, etc)
 - Apply appropriate levels of power redundancy and generator backup
 - Critical rooms can have UPS and Generator backup capabilities while less critical rooms may only have UPS. Reducing generator backup requirements reduces costs
 - Security can be applied differently to each room
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Datacenter



Multiple Datacenters within a single floor

- Differing levels of security
- Differing levels of redundancy
 - Critical Center - Generator Backup
 - Network Room - Generator Backup
 - HPC - No Generator, only UPs
- Dedicated Storage and Lab space
- 3 Layers of overhead trays
 - Raised floor dedicated to cooling
- Standardize Racks
- Room for growth

Multiple Workloads/Same Infrastructure and Facilities



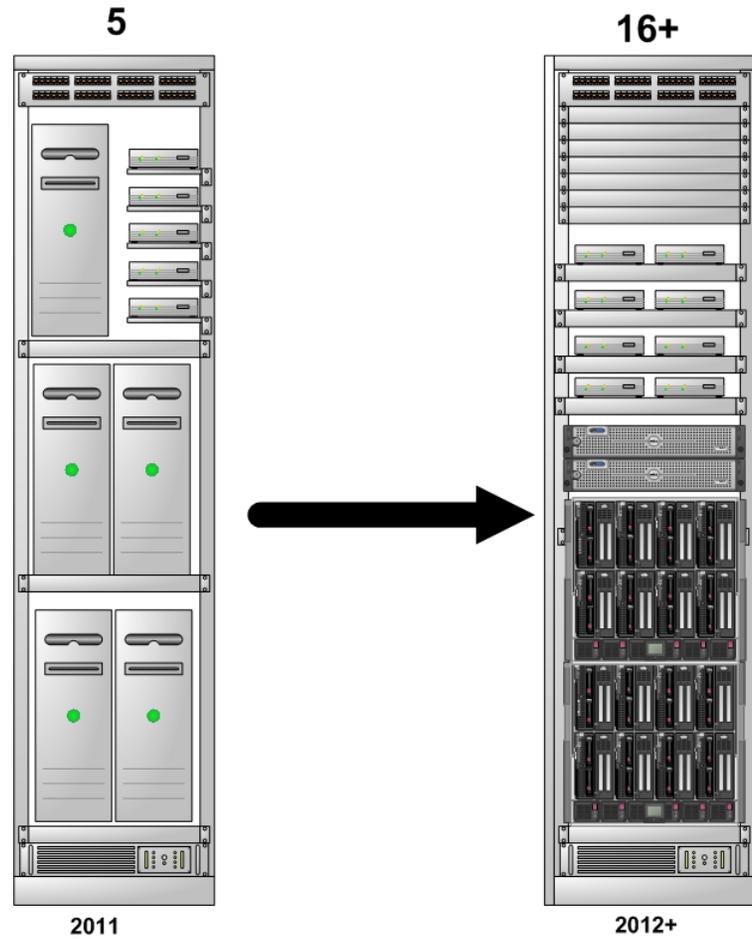
- HPC workloads for Seismic Processing and Reservoir Simulation
 - 2256 NVIDIA GPUs / 5160 CPU Cores
 - Client/Server workloads for interpretation/visualization
 - NetApps/Servers/Centralized workstations
 - GIS/Data management
 - Virtualized servers/Blade Chassis
 - Business/Finance workloads
 - IT/Network infrastructure
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Hess Tower Workstations

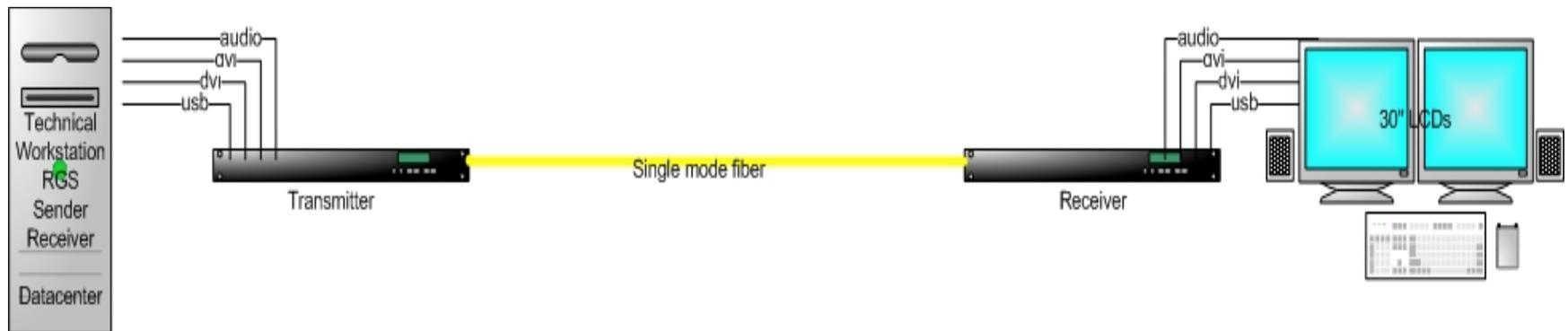
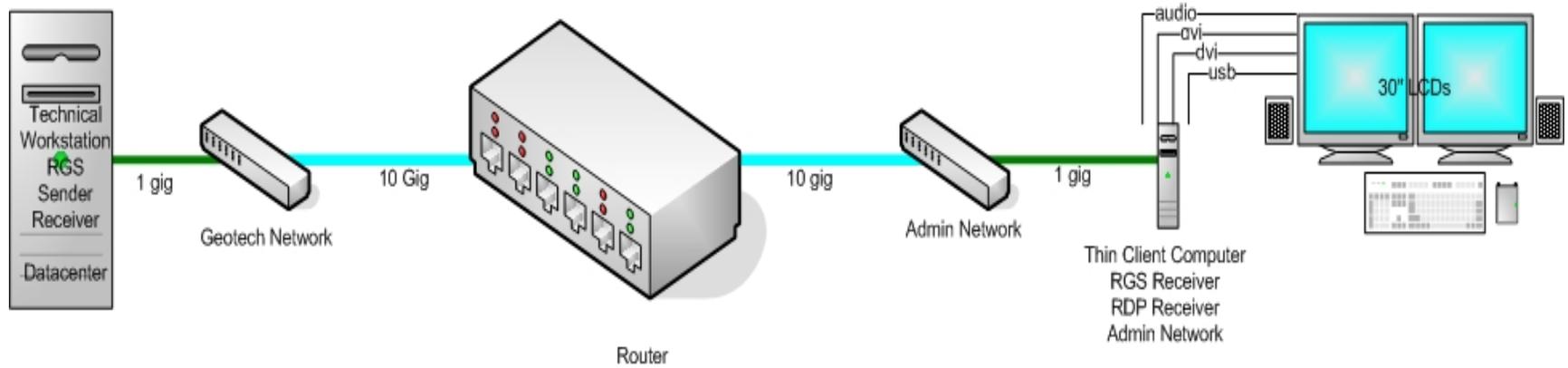


- 500 modern, high powered technical workstations for Geo-Technical work
 - Up to 192GB Ram, 12 cores, 10Gig networking, SSD disks and growing...
- Migration of technical workstations from offices to datacenters
- Use of remote computing techniques
 - Moving compressed pixels instead of data requires less bandwidth and allows for remote computing and collaboration
- Targeted use of environmentals
 - Workstations require large amounts of power, cooling, and space to operate properly
- Targeted use of technology
 - Network resources can be placed and expanded more easily
 - Workstations are pooled and reserved to users as needed
 - Preparation for VDI implementation in the future
 - Re-use of existing large workstations to preserve investment
 - Transitioning to rack friendly workstations whenever possible

Workstation Density



Thin Client / Desktop Extension



Hess Tower Visualization Rooms



- 50 Rooms where groups of people can collaborate and present technical information
 - High-end A/V equipment using Cube Wall, Large format LCD screens and Smartboard technologies
 - Video and Audio conferencing capabilities
 - No dedicated computers
 - Users remote control workstations via network protocols (RGS/RDP) and thin client computers
 - Presentation setups can be done in advance without access to room
 - Allows for easy presentations of large, complex presentations and reduces time for preparation work
 - Presentations can easily be turned into collaborations
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Multiple Viz Room Designs



Hi-Res Collaboration Rooms

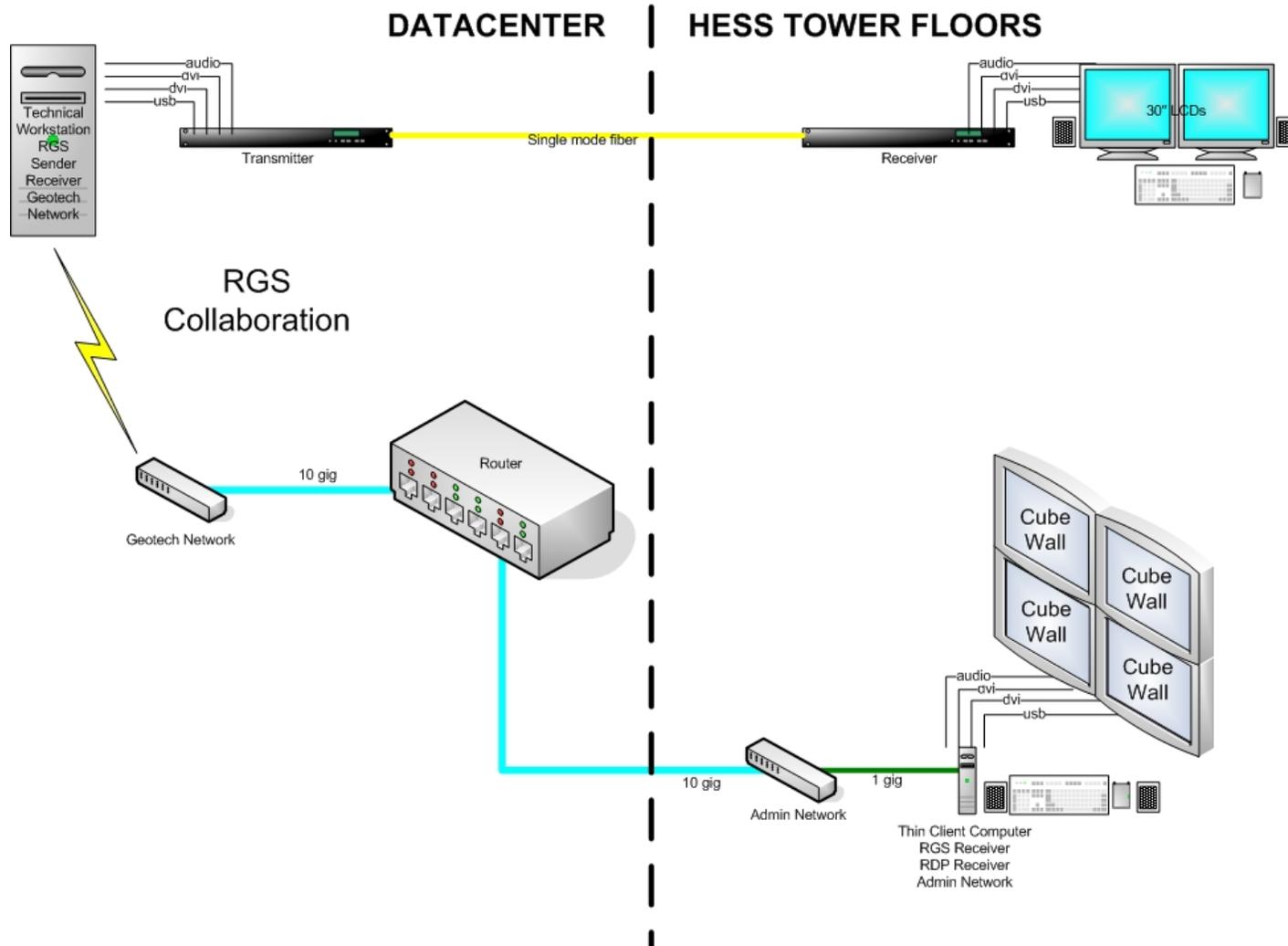
Hi-Res Cube-Wall Display
Video/Audio Conferencing
SmartBoard PC

Large Conference Rooms

103" LCD Display
Video/Audio Conferencing
SmartBoard PC or Whiteboard



Using the Viz Rooms



The Questions? Problems?



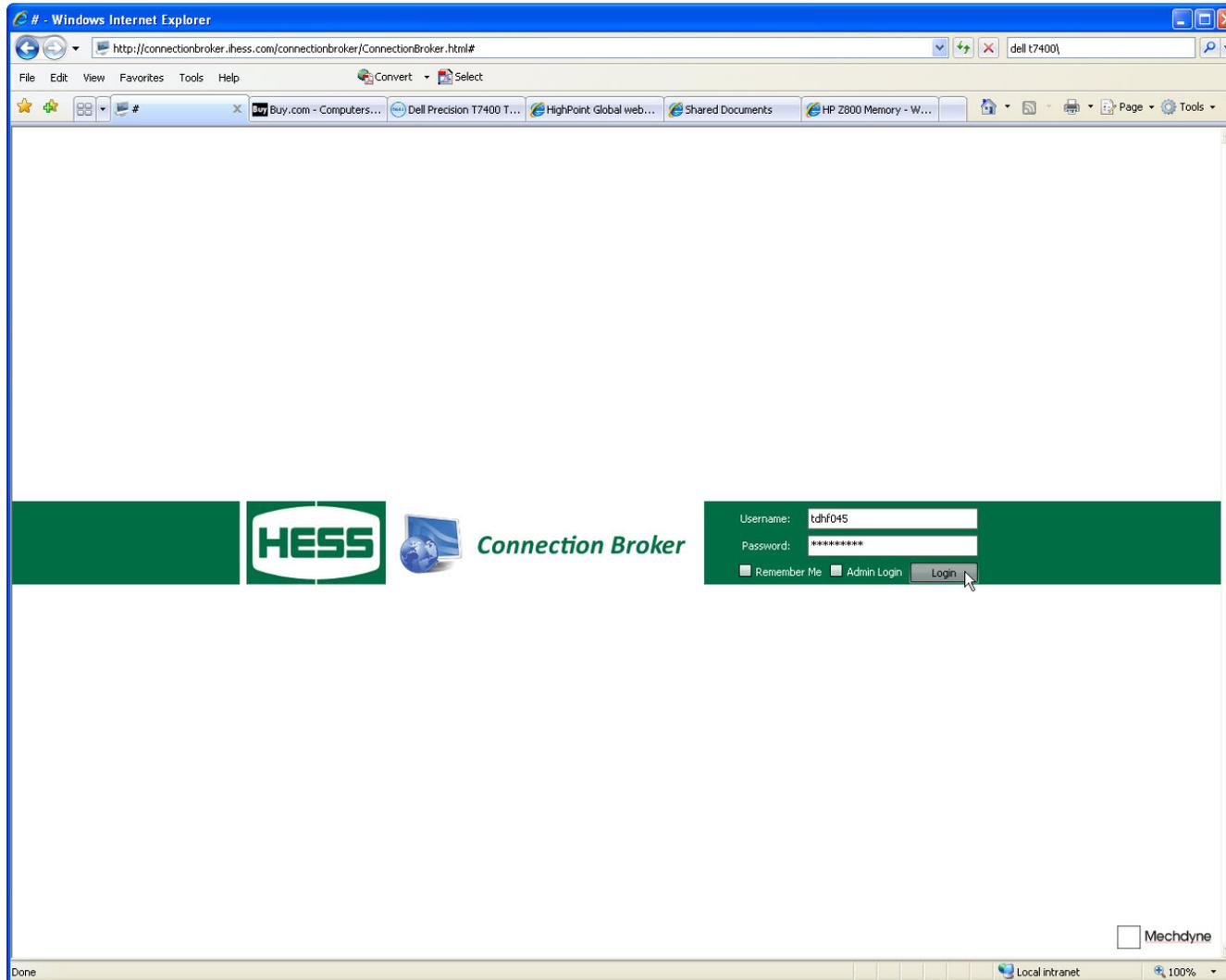
- Where are my workstations?
 - How do I access them?
 - How can I collaborate with my remote teammates?
 - How do I access my office workstation from the field?
 - I have a windows system but I need a Linux system to run a quick job
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Connection Broker



- Web based system supporting Microsoft and Redhat Operating systems
- Users can connect to any of 750 technical workstations in the Hess global network
- Empowers individuals and groups with global collaboration capabilities
- Reduces the need to travel to other sites because of the common, global desktop
- Facilitates travel, when required, by allowing users to quickly locate a computing resource
- Developed with Mechdyne with emphasis on using HP's Remote Graphics (RGS)

Connection Broker Login



Find a Linux machine



The screenshot shows a web browser window displaying the HESS Connection Broker interface. The page title is "Connection Broker" and the user is logged out as 'jdavis'. The main content area is titled "Machines" and contains a table listing various Linux machines. The table has columns for Hostname, Status, Operating System, RAM (Mb), CPU (GHz), Location, and Version. All machines listed are Red Hat Enterprise Linux Client release 5.3 (Tikanga) and are located in Houston. The status of all machines is "Available", indicated by a green power icon. Below the table, there are several filter checkboxes: Windows, Available, Linux, Unreserved, Houston Systems, Jakarta Systems, KL Systems, London Systems, Perth Systems, and Mechdyne. The "Available" and "Linux" checkboxes are checked. The browser's address bar shows the URL "http://connectionbroker.hess.com/connectionbroker/ConnectionBroker.html#".

Hostname	Status	Operating System	RAM (Mb)	CPU (GHz)	Location	Version
hac14s	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac13u	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac14g	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac12r	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	120994	2.94	Houston	1.978
hac13o	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac18l	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac13q	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac12e	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64450	2.94	Houston	1.978
hac13n	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac18i	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac12p	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac13l	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac13m	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac13p	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac14w	Available	Red Hat Enterprise Linux Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978

Collaborate



The screenshot shows a web browser window displaying the 'Connection Broker' interface. The main content area is titled 'People' and shows a list of users. A user profile for 'jdavis' is selected, showing their status as 'In training' and a list of sessions. A 'Send invitation...' dialog box is open, allowing the user to invite others to a session.

People

Username	Name	Personal Status Message
tdhf045	jdavis	In training

User Profile for jdavis

jdavis (In training)

Sessions | Details | Reservations

Hostname	RDP	RG5	OS	Orp...	Details	Start Time	Comments
hacddtc086						Tue Jan 17 08:03:0...	
hacddtc164						Mon Jan 16 16:15:5...	
hacliz						Wed Jan 11 13:54:...	
haclzb						Fri Jan 6 12:10:53 ...	

Send invitation...

Send an invitation to other users to join you on a computer for collaboration or a meeting. Simply choose the people you'd like to connect with, the computer where you'd like to meet and send the invitation.

People * jdavis

Computer * hacddtc086

Subject Connection Broker Session Invitation

Message Please join my session.

Invite Cancel

Reservations – my machines



The screenshot shows a Windows Internet Explorer browser window displaying the HESS Connection Broker interface. The page title is "My Reservations" and it features a search bar with the placeholder text "Look for...". The main content is a table listing reservations for the user "jdavis".

Hostname	Name	Starting Date	Ending Date	Status
hacddtc086	jdavis	Wed Dec 7 12:03:23 GMT-0600 2011		✓
haclyz	jdavis	Thu Dec 8 00:00:00 GMT-0600 2011		✓
haclyz	jdavis	Thu Jan 5 00:00:00 GMT-0600 2012		✓
hacddtc164	jdavis	Thu Jan 5 00:00:00 GMT-0600 2012		✓

At the bottom of the page, there is a checkbox labeled "Mechdyne" which is currently unchecked. The browser's status bar at the bottom indicates "Done" and "Local intranet | Protected Mode: Off".

Reserve a Computer



The screenshot shows the HESS Connection Broker web interface in a Windows Internet Explorer browser. The main page displays a table of machines with columns for Hostname, Status, Operating System, RAM (Mb), CPU (Ghz), Location, and Version. A modal dialog box titled "Machine Profile for hac14w" is open, showing details for the selected machine. Within this dialog, a "Request Reservation" sub-dialog is also open, allowing the user to specify the start and end dates for the reservation and whether it is permanent.

Hostname	Status	Operating System	RAM (Mb)	CPU (Ghz)	Location	Version
hac14w	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac14y	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac156	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.40	Houston	1.978
hac15q	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac15t	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac15v	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.896
hac15y	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac15z	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac164	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.20	Houston	1.896
hac166	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.20	Houston	1.978
hac16b	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.20	Houston	1.978
hac16g	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac16j	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.896
hac16k	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.896
hac16l	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac16n	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac16q	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.896
hac16r	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac16t	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac16u	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	64461	3.00	Houston	1.978
hac16v	Available	Microsoft Windows XP Professional x64 Edition	65536	3.00	Houston	1.896
hac179	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	3084	3.20	Houston	1.978
hac17g	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	127994	3.00	Houston	1.978
hac17h	Available	Red Hat Enterprise Linux: Client release 5.3 (Tikanga)	127994	3.00	Houston	1.978

Machine Profile for hac14w

Sessions | Details | Reservations

Name	RDP	RGS	OS	Orp...	Details	Start Time	Comments
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Request Reservation

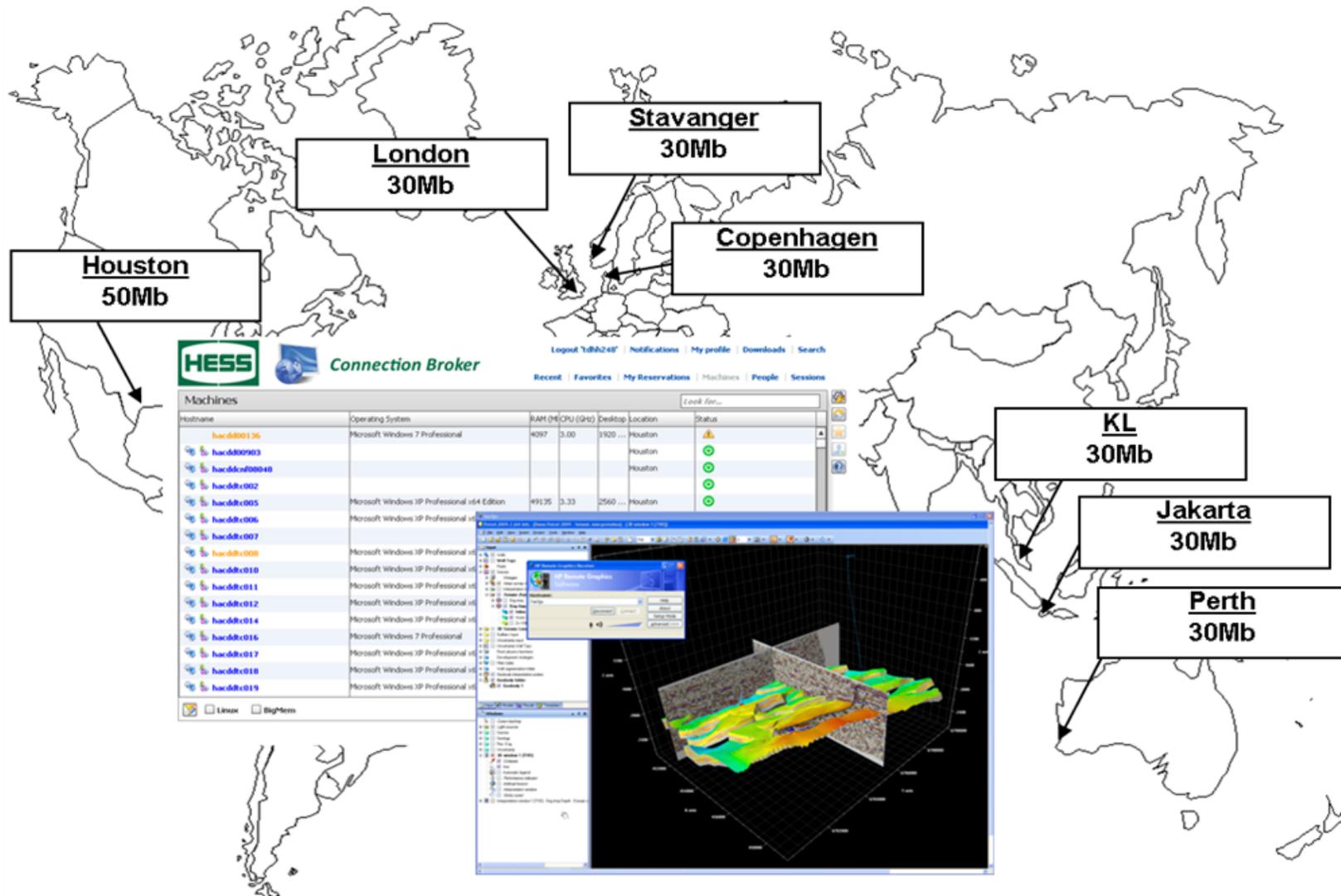
Hostname: hac14w Owner: tdhf045

Start Date: 01/18/2012 End Date: []

Permanent reservation

OK Cancel

Global Tool for Collaboration



Thanks!

