




IBM® Systems Director Active Energy Manager™ 4.3

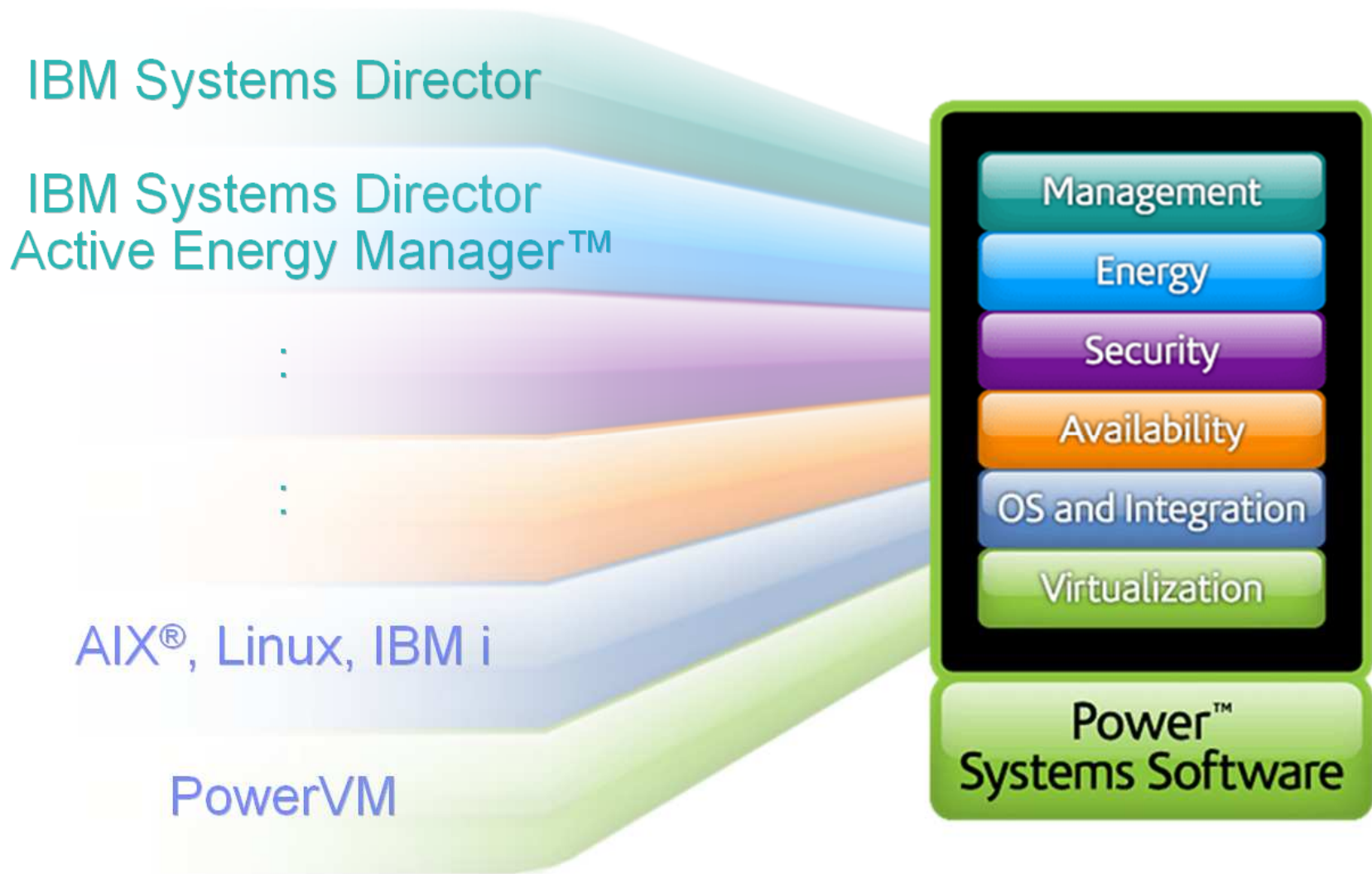
A decorative graphic at the bottom of the slide features a complex, multi-colored geometric pattern of triangles and squares in shades of blue, green, and grey. A bright light source on the left creates a lens flare effect, and a blue circular arrow points clockwise around a central point.

Dawn May
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Power your planet.

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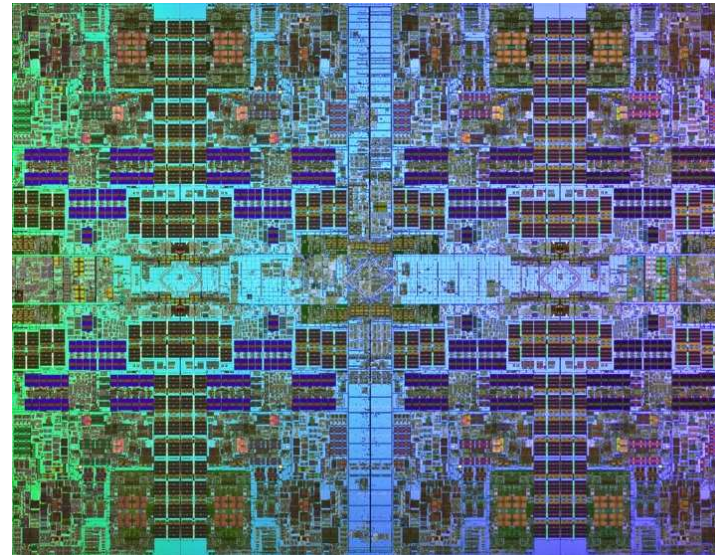
IBM Power Systems Software



Active Energy Manager - Agenda

- Presentation
 - Benefits
 - Monitoring functions
 - Management Functions
 - Configuring cooling devices
 - Configuring metering devices
 - Energy relationships and topology perspectives
 - Event propagation to related resources

Power Technology leadership



- ✓ 4, 6 or 8 cores per socket
- ✓ 3.0 to 4.14 GHz
- ✓ Up to 4 threads per core
- ✓ Integrated eDRAM L3 Cache
- ✓ Dynamic Energy Optimization

IBM EnergyScale Technology with POWER6 and POWER7

■ Power / Thermal Trending

- Collect and report power consumption, inlet and exhaust temp

■ Power Capping

- Processors are throttled to use less power

■ Power Savings

- Static Power Save (SPS)
- Dynamic Power Save (DPS)
 - Favor Power
 - Favor Performance (DPS-FP)



Benefits



- Manage data center power and cooling more effectively
 - Data collection from a multitude of sources
 - Real-time and historical analysis
 - Understand relationships between resources
 - Integrate with IBM Systems Director automation plans
- Communicates with facility management applications
 - Enabling IT administrators to better monitor power issues in real time
- Adjust power usage on select systems for better utilization of existing resources
 - Power savings
 - Power capping
 - PDU+ outlet control
- Plan for the future by viewing trends of power and environment data over time to address potential capital investments due to energy

Active Energy Manger Task Page

- Settings
- Status
 - Highest power and temperatures
- Monitor
 - Active Energy Managed Resources
 - Candidate Energy Managed Resources
 - Energy Managed Resources by Type
 - Externally Metered Energy Managed Devices
- Manage
 - Caps and savings
 - Plans
 - Configuration
- Automate
- License

Active Energy Manager Settings

Work with power-managed resources. View recent power and temperature status. Monitor power and environmental values. Configure power settings and automate tasks in response to power and environmental events.

Status

Top 5 highest average input power values

Today	Last 30 days
1,660W ATS_780	1,910W ATS_780
866.532W Server-8204-EBA...	1,175W SN#YK168082H2LJ
654W SN#YK168082H2LJ	1,126W SN#YK168082H2LJ
620W ATS_740	912.229W Server-8204-EBA...
608W ATSi7_750	811W ATSi7_750

Top 5 highest ambient temperature values

Today	Last 30 days
43C ATS DPI 4	43C ATS DPI 4
42C ATS DPI 3	42C ATS DPI 3
25C ATS_740	42C IBM DPI
24C ATS_780	28C ATSi7_750
23C 2 others	27C ATS_740

Status Tasks

[Access event log](#)

[View problems](#)

Monitor

Select a resource and press Show Active Energy Information for quick access to energy-related properties and tasks.

<Select>

Monitor Tasks

[View trend data](#)

[Calculate energy cost](#)

[View Active Energy monitors](#)

Work with resources managed by Active Energy Manager. Navigate to a resource, right-click, and choose an action.

Actions	Name	Type	Description
<input checked="" type="checkbox"/>	Active Energy Managed Resources (318)	Dynamic: Any	Resources managed by Active Energy Manager
<input type="checkbox"/>	Candidate Energy Managed Resources (12)	Dynamic: Any	Resources requiring a firmware upgrade or an external association t...
<input type="checkbox"/>	Energy Managed Resources by Type (10)	Static: Group	Energy managed resources based on resource type
<input type="checkbox"/>	Externally Metered Energy Managed Devices (0)	Dynamic: Any	Externally metered devices managed by Active Energy Manager

Page 1 of 1 | 1 Selected: 1 Total: 4 Filtered: 4

Manage

Set power caps and power savings mode. Configure power and environmental metering devices.

The number of resources using power management functions

Currently
0 Power cap
0 Power savings

Today
0 Power cap
0 Power savings

Management Tasks

[Work with power policies](#)

[Set power cap](#)

[Set power savings options](#)

[Configure metering device](#)

[Configure cooling device](#)

Automate

Create automation plans to automatically take action when a resource reaches a power or environmental threshold or when another Active Energy Manager event is generated. There are currently 0 configured power and environmental thresholds.

Automation Tasks

[Create automation plans](#)

[Manage thresholds](#)

License

Full license for Active Energy Manager is installed. Power management functions have been used on 0 resources today.

Monitoring Functions

Monitor Tasks

- View trend data
- Calculate energy cost
- View Active Energy monitors

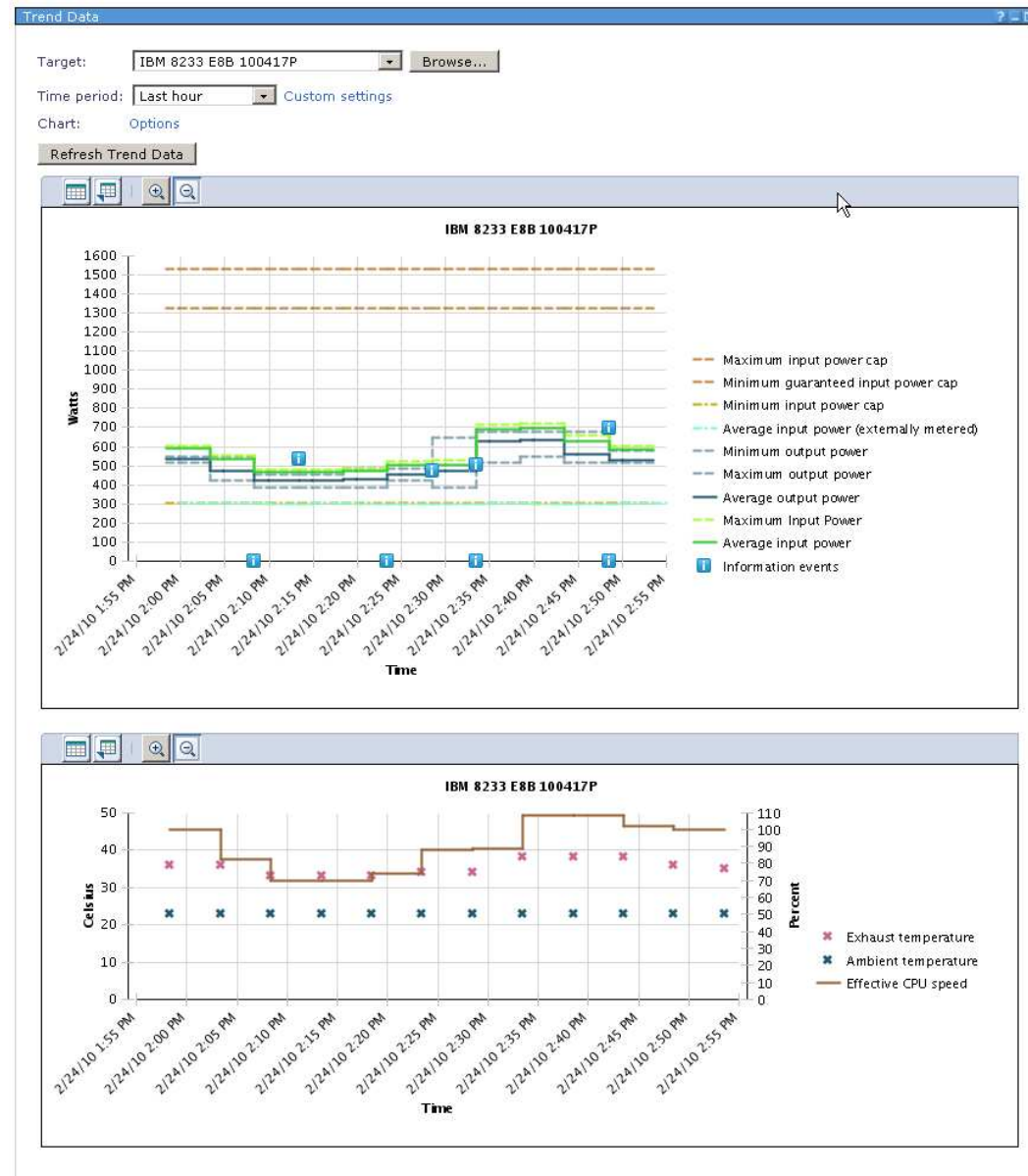
- Trend Data
 - Displays new and historical power and environmental data and events
 - Provides two views - chart and table
 - Can trend single resource or a group of resources
- Cost Calculator
 - Establish by a resource or group of resources over a period of time
 - Define cost assumptions
 - Displays amount of energy used and the cost of that energy
- Monitors & Thresholds
 - IBM Systems Director provides a function to create monitors
 - Active Energy Manager provides a number of monitors for the energy resources
 - Thresholds can be set on a monitor to cause an event to be created
 - Systems Director automation plans can be triggered from an energy event
 - Active Energy Manager monitors and thresholds are integrated into IBM Systems Director function System Status and Health

Trend Data

- Energy trends in upper chart
 - Input & output power
 - Maximums, averages & minimums
 - Power caps
 - Data are averages over intervals

- Temperature data in lower chart
 - Discrete values
 - Plotted against left axis

- Effective CPU speed in lower chart
 - Data are averages over intervals
 - Plotted against right axis
 - May exceed 100%



Energy Cost Calculator

- Estimates the cost of energy used for a resource or group of resources over a specified period of time
- User inputs the known values or best assumptions for energy price and cooling rate multiplier
- Displays a visual indication of the number of watt-hours consumed
- Compares actual use to what would have been consumed had nameplate power been drawn over that entire period
- May provide input for hardware upgrade investment

Energy Event Monitors

- Over twenty types of energy monitors
- Monitor resources or groups of resources
- Displayable on Health Summary
- Thresholds can be defined and activated
- Events can be used in Systems Director Automation Plans
- Other energy events
 - Start / end power capping or power savings

The screenshot displays the IBM Systems Director web interface. At the top, there's a 'Health Summary' section with a 'Scoreboard' showing 2 problems. Below it, a 'Dashboard' features three charts: 'Avg Input Pwr' (peaking at 620), 'Amb Temp' (at 100), and 'SysDir CPU' (at 100). A 'View Monitors' button is present. The main area shows a table of systems with problems, including IBM 8233 E8B 100417P with a 'Warning' status. A 'Monitor View' window is open, displaying a table of active energy monitors for the selected system.

Select	Name	Monitor Name	Monitor T...	Threshol...	Current	Warning	Criti...
<input type="checkbox"/>	IBM 8233 E8B 100417P	Ambient Temperature	Individual		23		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Average CPU Speed	Individual		3,556		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Average Input Power	Individual	Activated	595	>= 525.0	>= 600.0
<input type="checkbox"/>	IBM 8233 E8B 100417P	Average Input Power (externally metered)	Individual		303		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Average Output Power	Individual		537.142		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Effective CPU Speed	Individual		100		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Exhaust Temperature	Individual		36		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Maximum Ambient Temperature	Individual		.		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Maximum Exhaust Temperature	Individual		.		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Maximum Input Power	Individual		604		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Maximum Output Power	Individual		548		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Maximum Power Cap	Individual		1,526		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Minimum Ambient Temperature	Individual		.		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Minimum Exhaust Temperature	Individual		.		
<input type="checkbox"/>	IBM 8233 E8B 100417P	Minimum Guaranteed Power Cap	Individual		1,323		

Management Functions

Management Tasks
Work with power policies
Set power cap
Set power savings options
Configure metering device
Configure cooling device

- Power savings
 - Static power saver
 - Use for predictable demand dip, such as nights and weekend
 - Use for critical peak reductions
 - May not affect throughput
 - Dynamic power saver
 - Energy / utilization trade-off
 - Favor performance or power savings

- Power capping
 - Not for saving power, but for allocating limited power across systems
 - Has minimum guaranteed settings

- PDU+ outlet control
 - Works with specific hardware
 - Allows on / off / reboot
 - Control through IBM Systems Director schedule or action plan
 - Understand all implications before using

Power Savings Settings

IBM Systems Director - Mozilla Firefox: IBM Edition

IBM Systems Director

IBM* Systems Director Welcome root Problems 0x 2 Compliance 0x 0 Help | Logout IBM.

Power Syste... x Navigate Re... x Power Savin... x --- Select Action ---

Power Savings

System power usage can be regulated by selecting one of the following options:

- No power savings
- Static power savings
- Dynamic power savings

You have the option to favor performance or favor power

- Favor Power Favor Performance

Targets:

Name	Current power mode	Available power modes
Server-8204-E8A-SN10C...	No power savings	Static power savings, Dynamic power savings

Page 1 of 1 1 Total: 1

Save Close

Transferring data from asj2director.rchland.ibm.com...

Power Capping Settings

Choose either an absolute power cap, or a percentage of the available power cap.

Activate Power Capping Deactivate Power Capping

Output power cap type:

- Percentage power cap
- Absolute value (Watts)
- Percentage power cap

0% (287W) 100% (1,248W) 80%

Values between 0% (287W) and 85.84% (1,112W) are not guaranteed

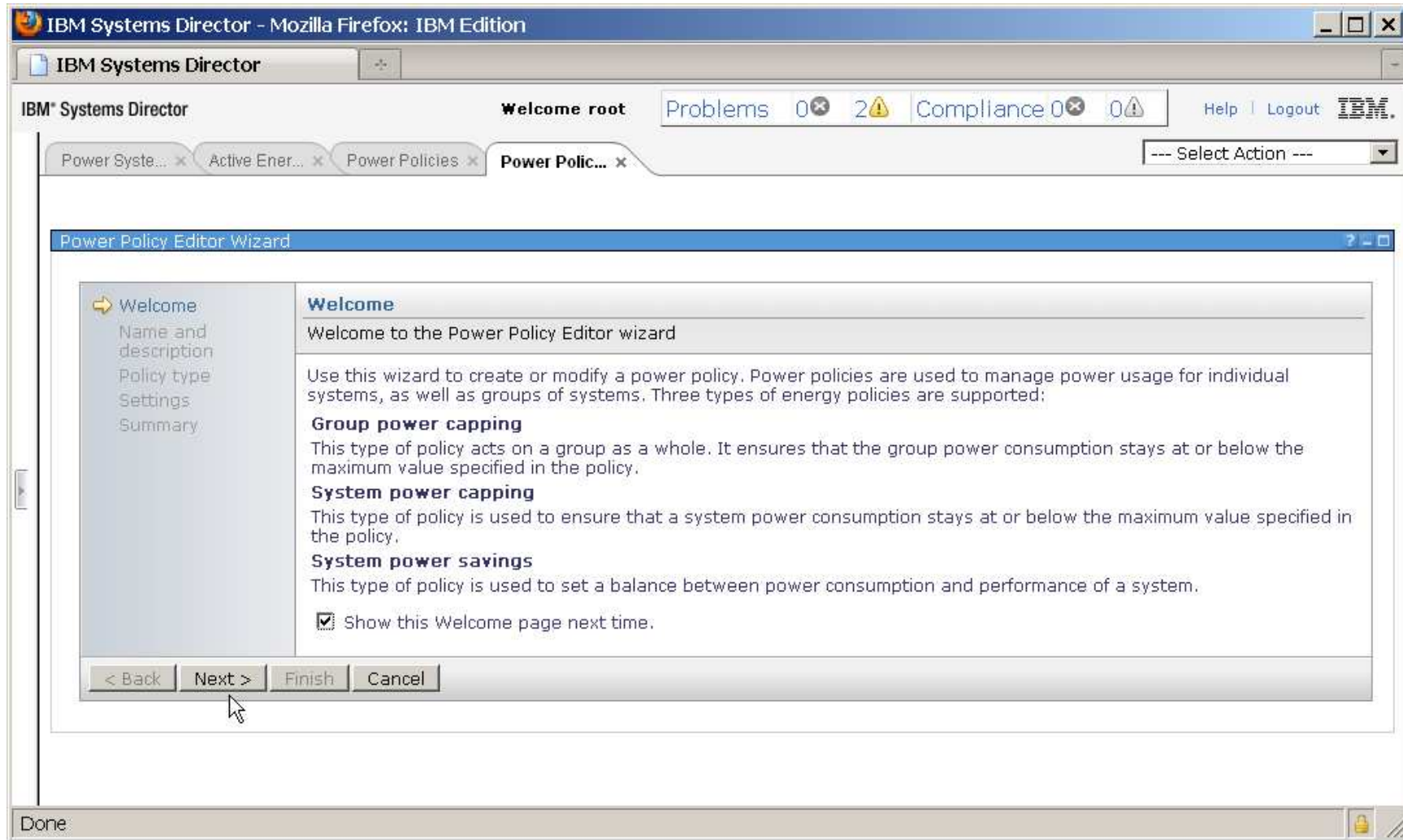
Targets:

Name	Current power cap	Power Capping
Server-8204-E8A-SN10C...	None	Inactive

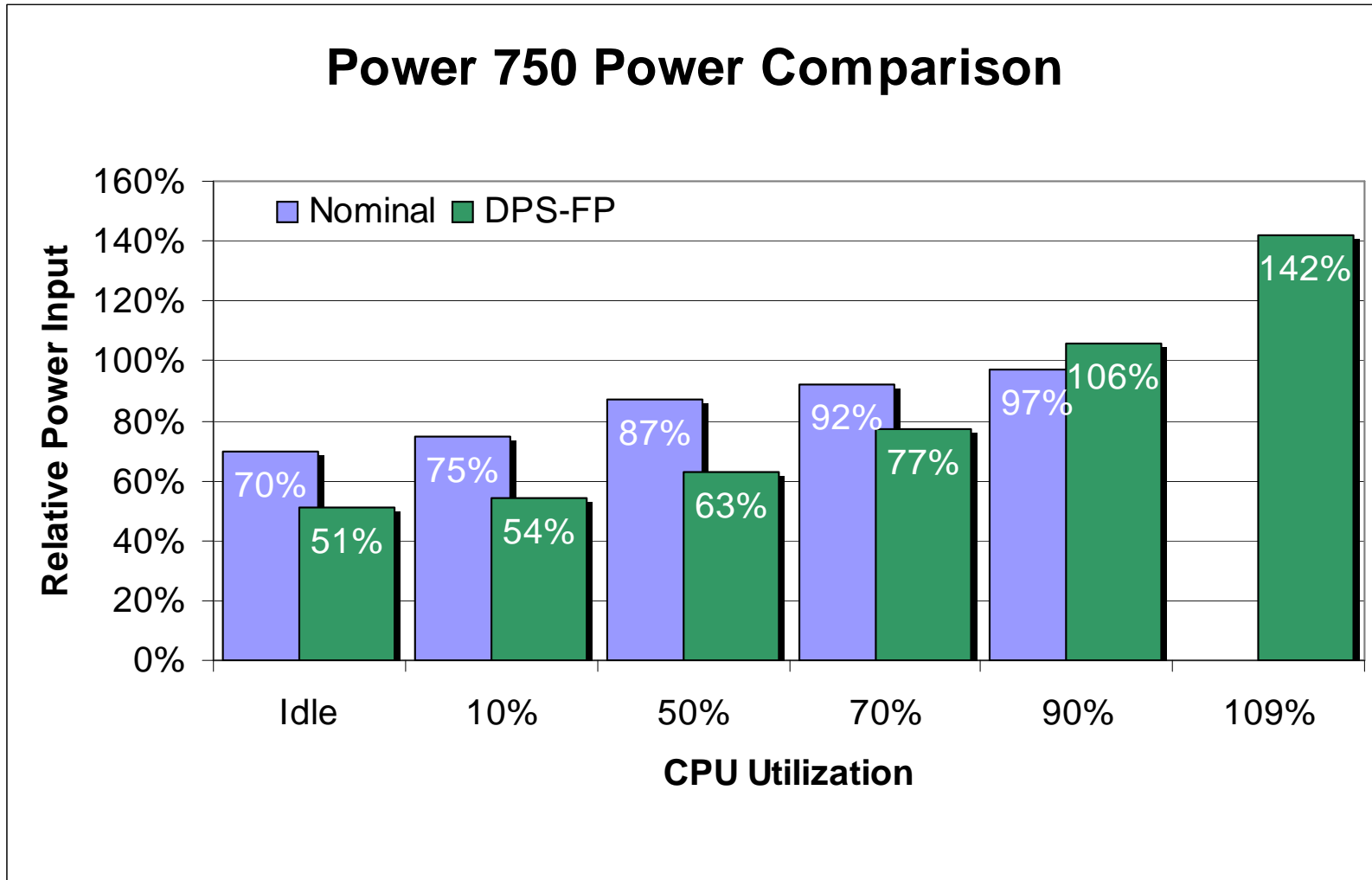
Page 1 of 1 1 Total: 1

Save Close

Power Policy Editor Wizard



POWER7 Over-Clocking



Power management commands

- **getpcap**
 - Get the current power cap values for the specified Active Energy Manager resources
- **setpcap**
 - Get the current power cap values for the specified Active Energy Manager resources
- **getpsaver**
 - Get the current power savings values for the specified Active Energy Manager resources
- **setpsaver**
 - Set the power savings to static, dynamic or off with favor power savings over performance or favor performance over power savings to the selected Active Energy Manager resources
- **lspolicy**
 - List policy attributes
- **chpolicy**
 - Create, modify and delete policies
- **setpolicy**
 - Set the policy to the specified resource
- **getoutletstate**
 - Display the state of the specified power outlet resource
- **setoutletstate**
 - Set the state of the specified power outlet resource

Sensors, Facilities and Hardware Support

- Sensors and PDUs
 - Avocent PDUs
 - Arch Rock PhyNet 3.5.4 or 4.0, IPpower nodes and IPthermal nodes sensors
 - APC PDUs (4.1.1.1)
 - Geist
 - Rittal PDUs
 - Server Technology
 - SynapSense Version 5
- Facilities Vendors
 - APC InfraStruXure Central V6.0
 - Eaton Power Xpert Reporting (PXR) V2.0
 - Emerson-Liebert SiteScan sensor support
- Server Hardware
 - Power Systems servers
 - System X

Newer IBM Systems Support

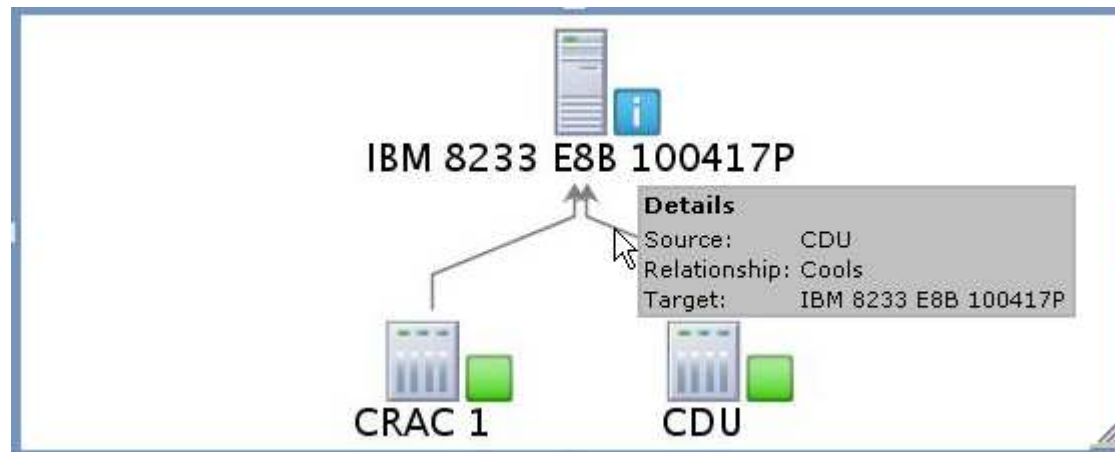
	Firmware Level ¹		Power Monitoring	Power Capping	Power Savings
	BIOS	BMC			
System x3200 M3 (7327, 7328)	latest firmware	latest firmware	Yes	Yes	Yes ²
System x3250 M3 (4251, 4252)	latest firmware	latest firmware	Yes	Yes	Yes ²
System x3850 M3 (7145, 7146)	latest firmware	latest firmware	Yes	Yes	Yes ²
BladeCenter HS22V (1949, 7871)	latest firmware	latest firmware	Yes	Yes	Yes ²
	HMC	FSP			
IBM Power 750 (8233-E8B)	R710.0	EM710	Yes	Yes ⁵	Yes ⁶
IBM Power 755 (8233-H8B)	R710.0	EM710	Yes	Yes ⁵	Yes ⁶
IBM Power 770 (9119-MMB)	R711.0	EM711	Yes	Yes ⁵	Yes ⁶
IBM Power 780 (9179-MHB)	R711.0	EM711	Yes	Yes ⁵	Yes ⁶

Hardware Support Notes

1. The supported firmware levels listed for each server/machine type are those that have been tested with Active Energy Manager. The listed firmware levels and later levels are supported.
2. Power savings is enabled by the BIOS and controlled thereafter by the operating system. Active Energy Manager cannot control power savings in this case.
3. Nameplate power will not be available for this server until a later firmware release.
4. Supports power capping in single-node configurations only. Capping is not supported in multi-node configurations.
5. Supports soft power capping.
6. Supports dynamic power savings.
7. Supports static power savings only.

Configuring Cooling Devices

- Manually configure a cooling device to specify which resources it cools
- View all resources cooled by a cooling device
- Viewing all cooling devices which cool a resource
- Events can be generated for a resource when an associated cooling device experiences a severe event



Configuring Metering Devices

- Create associations directly with Power Distribution Units and Uninterruptible Power Supplies
- Outlets or power sensors do not need to be detected for these devices
- Enables the associated resources to be part of the Active Energy Power perspective support and the power event propagation support



Power and Cooling Relationships

- Active Energy Power perspective
 - High-level view of how power flows between resources
 - Defines relationships between resources which supply power and resources which consume that power

- Active Energy Cooling perspective
 - High-level view of how cooling is provided for resources
 - Defines relationships between cooling units and the resources which rely on them

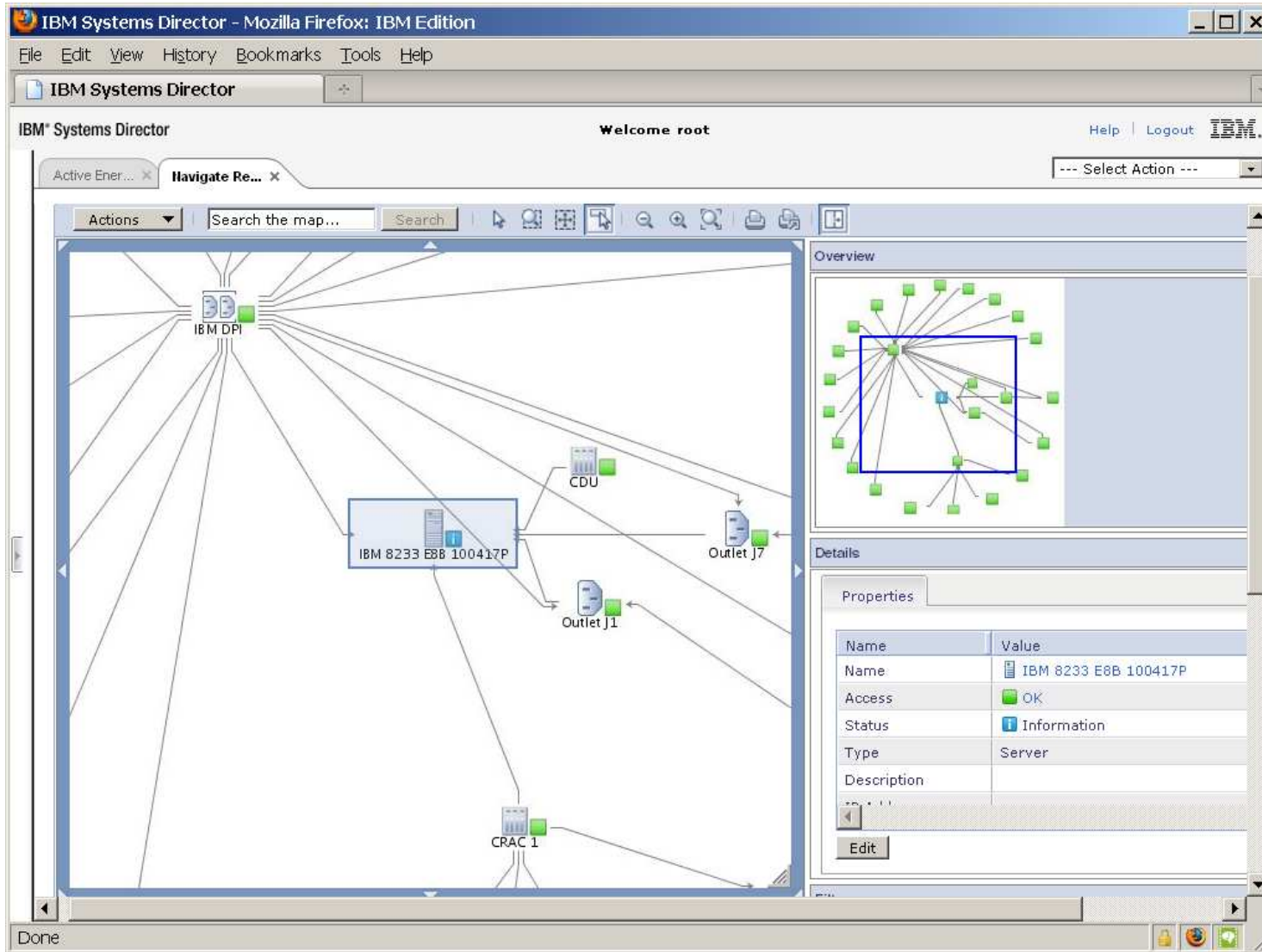
The screenshot shows a window titled "Navigate Resources" with a breadcrumb path: "Energy Managed Resour..." > "Energy Managed Power ..." > "IBM 8233 E8B 100417P (Active Energy - All - Relationship View)". Below the breadcrumb is a search bar with the text "Search the table..." and a "Search" button. The main content is a table with the following data:

Select	From	Relationship Type	To
<input type="checkbox"/>	CDU	→ Cools	IBM 8233 E8B 100417P
<input type="checkbox"/>	CRAC 1	→ Cools	IBM 8233 E8B 100417P
<input type="checkbox"/>	IBM DPI	→ Supplies Power To	IBM 8233 E8B 100417P
<input type="checkbox"/>	Outlet J1	→ Supplies Power To	IBM 8233 E8B 100417P
<input type="checkbox"/>	Outlet J7	→ Supplies Power To	IBM 8233 E8B 100417P

Event Propagation to Related Resources

- Based on configured power and cooling relationships
- For a severe event for a Power Unit
 - Severe event is generated for each associated resource
 - Event type notes that power may have been lost
 - Automation plans can be based on the associated resource
- For a severe event for a Cooling Unit
 - Warning event is generated for each associated resource
 - Event type notes that the resource may no longer be sufficiently cooled
 - Automation plans can be based on the associated resource

Energy Relationships and Topology Perspectives



Active Energy Properties Tab

- Additional Highlights and Tasks sections
 - Highlights key energy information
 - Fast path to related energy tasks

- Two additional options for accessing Active Energy properties
 - Right click an energy managed resource, and choose Energy→ Active Energy Properties
 - On the Active Energy Manager task page, select a resource then click the “Show Active Energy Information” button in the Monitor section

Performance considerations

- Internal product performance enhancements
- “Default metering active” added to Active Energy Manager settings
- Installation option to defer start of metering
- Systems Director Workload Estimator Plugin?

<i>Director Resources Discovered</i>	<i>AEM Resources in Metering Mode</i>	<i>AEM Resources Metered</i>
2 Blade Centers 1 System p Server 1 System x Server 1 System z HMC 2 SynapSense Networks 2 PDUs	2 Blade Centers 1 System p Server 1 System x Server each z Server (ex 2) each Sensor Node (ex 12) 2 PDUs	2*52 (Blades, Slots, Modules, ...) 1 1 2 each Sensor (ex 12*5) each Outlet, Outlet Group, Sensor (ex 40)
9 Total	20 Total	208 Total

- See the Performance Tuning and Scaling Guide for IBM Systems Director 6.2
 - <http://www-01.ibm.com/support/docview.wss?uid=nas7cd6a96f49d05f608862577420075ca9a>

IBM Systems Director Editions for Power , V6.2

- IBM Systems Director Express Edition
 - IBM Systems Director V6.2
 - IBM Systems Director VMControl Express Edition for Power, V2.3
 - IBM Systems Director Service and Support Manager V6.2
 - IBM Systems Director Transition Manager V6.2 for HP Systems Insight Manager

- IBM Systems Director Standard Edition
 - All of Express Edition plus..
 - IBM Systems Director Standard Edition Launchpad V6.2
 - IBM Systems Director Active Energy Manager™ V4.3
 - IBM Systems Director VMControl Standard Edition for Power, V2.3
 - IBM Systems Director Network Control V1.2

- IBM Systems Director Enterprise Edition
 - All of Standard Edition plus...
 - IBM Systems Director VMControl Enterprise Edition for Power, V2.3
 - IBM Tivoli Monitoring (ITM) V6.2.2 FP2
 - IBM Tivoli Monitoring (ITM) - OS Agents
 - IBM Tivoli Monitoring (ITM) - System p Agents
 - IBM Tivoli Monitoring for Energy Management 6.2.1
 - IBM Tivoli Application Dependency Discovery Manager (TADDM) 7.2
 - IBM Tivoli Performance Analyzer 6.2.2
 - IBM Tivoli Common Reporting for Asset and Performance Management 1.3
 - DB2 Enterprise Server Edition 9.7 FP1

- * IBM United States Software Announcement 210-100, July 20, 2010

Useful information Sources

- Systems Director Information Center
 - Overview of Active Energy Manager
 - Planning for Active Energy Manager
 - Installing Active Energy Manager
 - Accessing Active Energy Manager
 - Navigating Active Energy Manager resources
 - Configuring default Active Energy Manager settings
 - Monitoring power usage
 - Managing power usage
 - Troubleshooting and support
 - Reference
 - Publications and related information
 - Glossary

http://publib.boulder.ibm.com/infocenter/director/v6r2x/topic/com.ibm.director.aem.helps.doc/frb0_main.html

Useful information Sources

- Energy Scale White Papers

- IBM EnergyScale for POWER6 Processor-Based Systems

<http://www-03.ibm.com/systems/power/hardware/whitepapers/energyscale.html>

- IBM EnergyScale for POWER7 Processor-Based Systems

<http://www-03.ibm.com/systems/power/hardware/whitepapers/energyscale7.html>

- EnergyScale Features

- User Interfaces

- Performance analysis

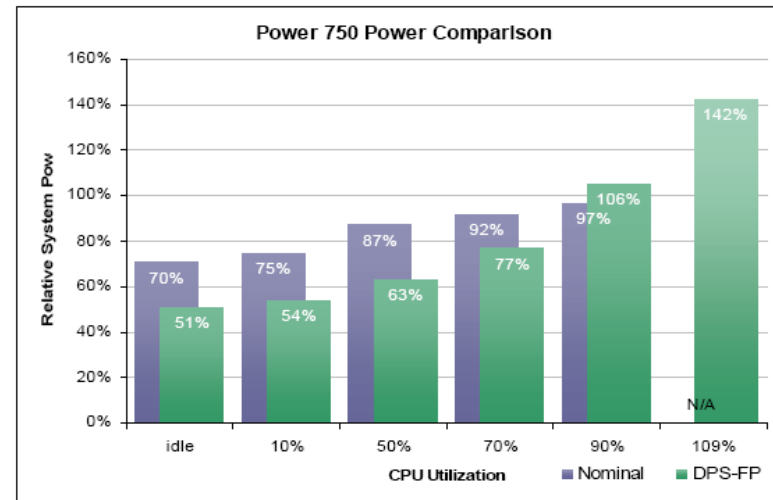


Illustration 30: Dynamic Power Optimizer, when enabled on an example Power 750 server, yields significant power savings at low utilization. At extremely high workloads, CPU utilization may exceed that of nominal at the expense of total power consumed.

IBM Systems Energy Estimator

- Web-based tool for estimating power requirements for IBM Power Systems

<http://www-947.ibm.com/systems/support/tools/estimator/energy/index.html>

System configuration

Processor Model: 750-8233-E8B 8336 3550 32

Desired CPU utilization: 100%

Number of cores: 32 Active cores

512MB DIMMs	1GB DIMMs	2GB DIMMs	4GB DIMMs	8GB DIMMs	16GB DIMMs	32GB DIMMs	Total Memory
N/A	N/A	N/A	0	0	24	N/A	384 GB

Internal Media: Backplane for 2.5 inch media, external SAS support

DVD	Tape	10K rpm Disk	15K rpm Disk	Solid State Disk
Yes	No	0	0	0

PCI

PCI Cards	GX Cards	Additional PCI or GX cards
3	1	N/A

Integrated Host Ethernet Adapter: Integrated 4-port 1Gb Ethernet Card

Expansion + Add

Disks	PCI	Configuration Rule	Disk Type
0	0	using 5886 and 5796	15K

+ Duplicate

[Continue](#)

IBM Systems Energy Estimator v2010.1 25-Feb-2010 www-912

Model:	750-8233-E8B		
rPerf:	331.06		
Processor CPW:	181,000		
Cores:	32 cores		
Processor:	IBM® POWER7		
Clock speed:	3550 MHz		
Configured Memory:	384 GB		
Estimated energy:	1658 Watts 5659 BTU/hr		
Included components:	Qty	Feature	Description
	4	8336	POWER7 8-core 3.55 GHz Processor Card
	32		Active Cores
	1		System Planar
	12	4528	Memory - 32GB (2 x 16GB)
	1	8340	Backplane for 2.5 inch media, external SAS support
	1	5756	DVD
	1	5624	Integrated 4-port 1Gb Ethernet Card
	1		Generic GX Adapter
	3		Generic PCI card
	1	N/A	Standard Fans/Blowers

Note: This is an estimate only. Actual results may vary.

Note: Data used for this energy estimate was collected in an ambient temperature environment using redundant power supplies with system resources operating near maximum levels, unless specified otherwise in the table above.

Customer Reference for Power Management

- United States Bowling Congress uses intelligent sensors and power management for energy savings
 - <http://www-03.ibm.com/press/us/en/pressrelease/27220.wss>

Winner of COMMON US 2009 Innovation award for energy efficiency.

http://www.talktenpin.net/index.php?option=com_content&task=view&id=3530&Itemid=78

United States Bowling Congress

Consolidated onto Power servers and blades with PowerVM Active Energy Manager

USBC uses intelligent sensor technology to manage power utilization to reduce cooling and electricity costs in its data center. ...resulting in a nearly 50 percent reduction in cooling cost and eliminates more than five tons of carbon emissions annually.

Jim Oberholtzer
Vice President Technology



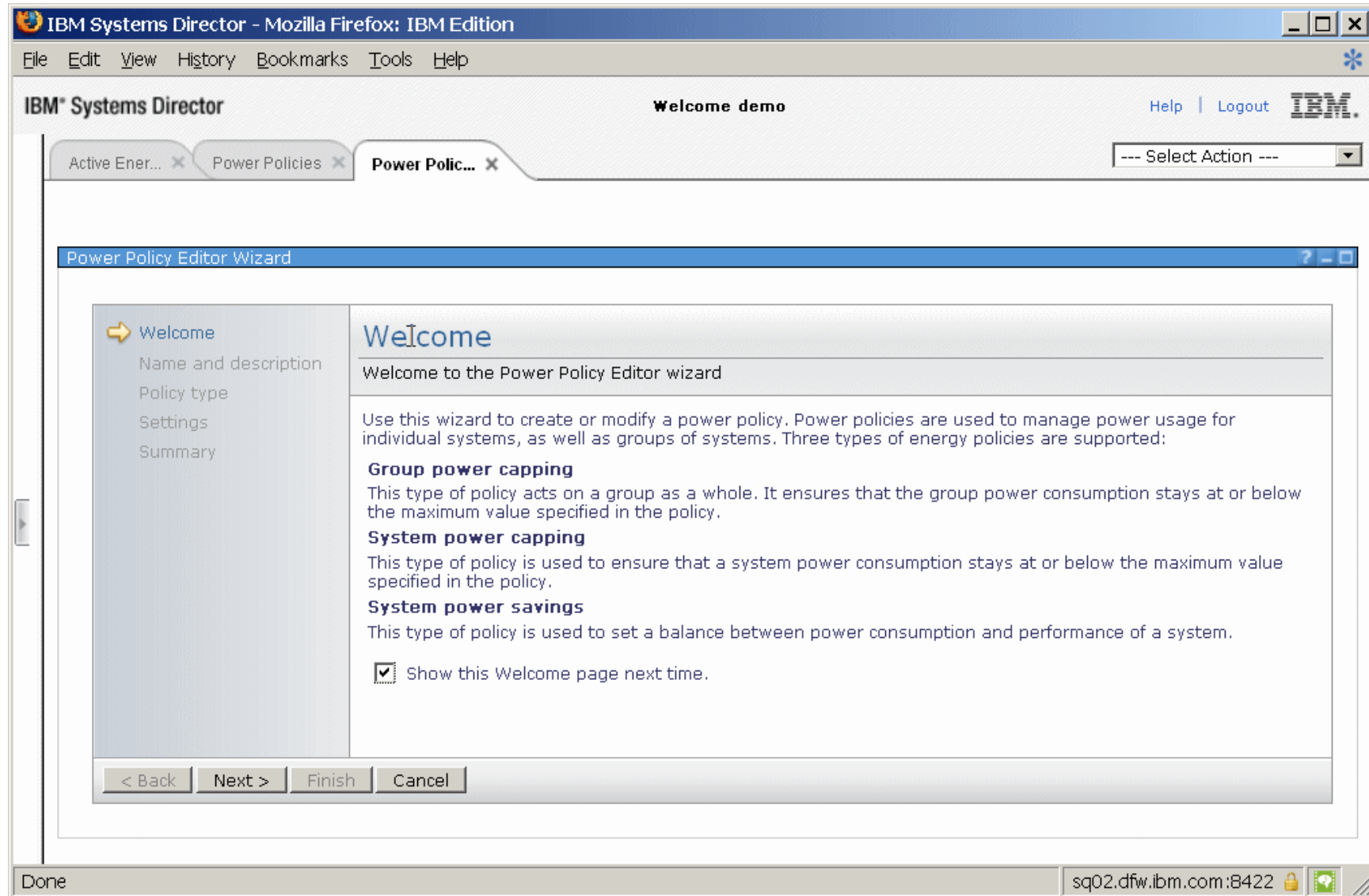
AEM Red Books

- Going "Green" with IBM Active Energy Manager
 - <http://w3.itso.ibm.com/redpieces/abstracts/redp4361.html>
- Implementing IBM Systems Director Active Energy Manager
 - <http://w3.itso.ibm.com/abstracts/sg247780.html>

Additional material

- Creating a power policy
- Applying a power policy
- Viewing trend data as policies are applied and removed

Creating a Power Policy (1 of 6)



Creating a Power Policy (2 of 6)

IBM Systems Director - Mozilla Firefox: IBM Edition

File Edit View History Bookmarks Tools Help

IBM Systems Director Welcome demo Help Logout IBM.

Active Ener... Power Policies Power Polic... --- Select Action ---

Power Policy Editor Wizard

Welcome
Name and description
Policy type
Settings
Summary

Name and description

Specify the name and description of the power policy.

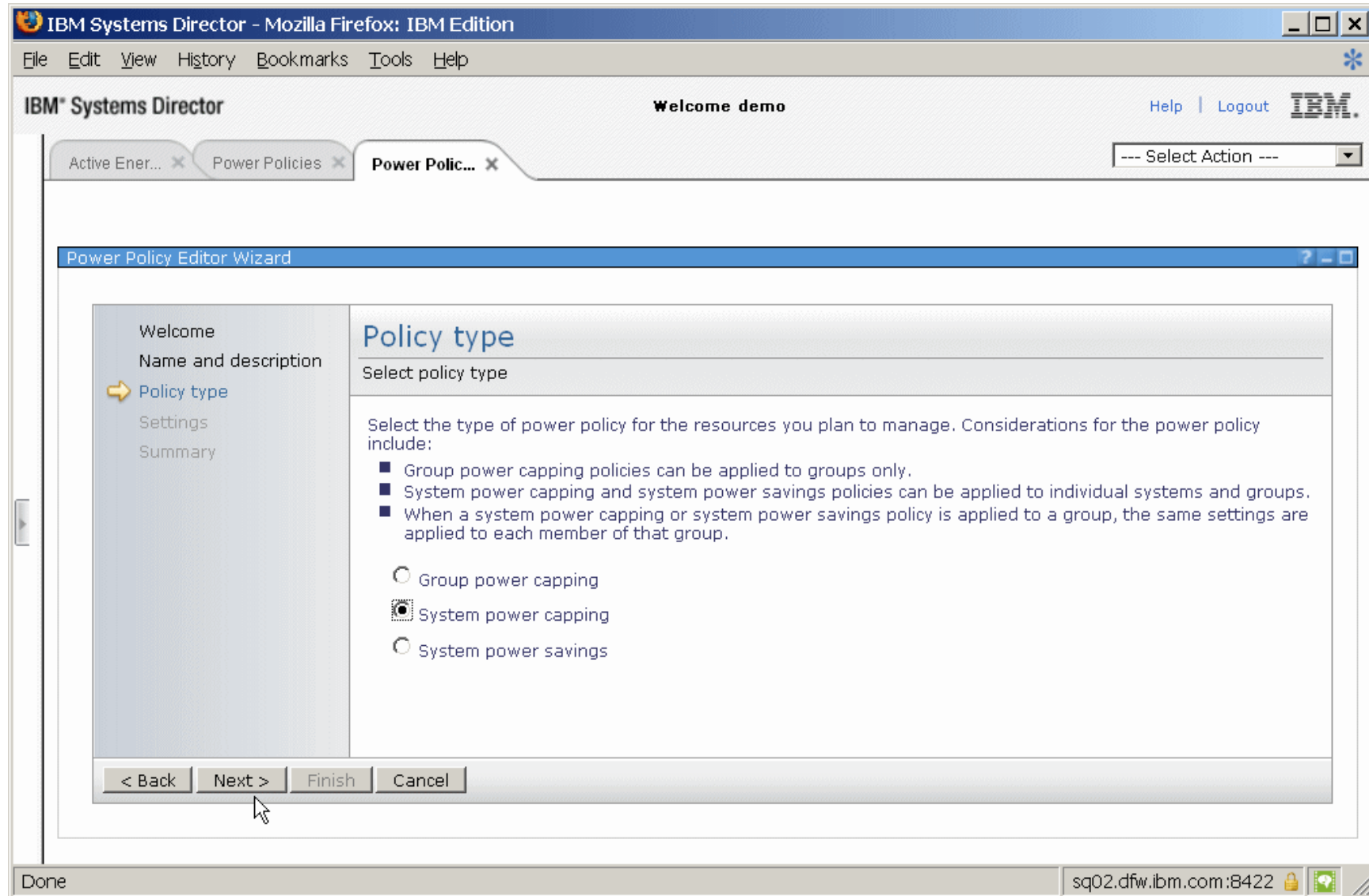
*Name:
System cap

Description:
Policy for power capping a system

< Back Next > Finish Cancel

Done sq02.dfw.ibm.com:8422

Creating a Power Policy (3 of 6)



Creating a Power Policy (4 of 6)

The screenshot shows the IBM Systems Director web interface in Mozilla Firefox. The browser title is "IBM Systems Director - Mozilla Firefox: IBM Edition". The page header includes "IBM Systems Director", "Welcome demo", and links for "Help" and "Logout". There are tabs for "Active Ener...", "Power Policies", and "Power Polic...". A dropdown menu shows "--- Select Action ---".

The main content area is titled "Power Policy Editor Wizard" and is currently on the "Settings" step. A sidebar on the left lists the wizard steps: "Welcome", "Name and description", "Policy type", "Settings" (highlighted with a yellow arrow), and "Summary".

The "Settings" section has the heading "Settings" and the instruction "Specify settings for this power policy." Below this, it says "Choose either an absolute power cap, or a percentage of the available power cap." There are two radio button options: "Activate Power Capping" (selected) and "Deactivate Power Capping".

Under "Activate Power Capping", there is a text box: "You can specify power cap in terms of an absolute value or a percentage of the maximum power cap". Below this is a "Power cap type:" label and a dropdown menu set to "Absolute value (Watts)". A required field label "*Power cap value:" is followed by a text input field containing "1400".

At the bottom of the wizard, there are four buttons: "< Back", "Next >", "Finish", and "Cancel". A mouse cursor is hovering over the "Next >" button, and a small "Next" tooltip is visible below it.

The browser status bar at the bottom shows "Done" on the left and "sq02.dfw.ibm.com:8422" on the right.

Creating a Power Policy (5 of 6)

The screenshot shows the IBM Systems Director web interface in Mozilla Firefox. The browser title is "IBM Systems Director - Mozilla Firefox: IBM Edition". The page header includes "IBM Systems Director", "Welcome demo", and "Help | Logout IBM.". The breadcrumb trail shows "Active Ener..." > "Power Policies" > "Power Polic...". A dropdown menu shows "--- Select Action ---".

The main content area is titled "Power Policy Editor Wizard" and shows a "Summary" step. A sidebar on the left lists the wizard steps: Welcome, Name and description, Policy type, Settings, and Summary (which is selected with a yellow arrow). The summary text reads: "A power policy with the following settings will be saved when you click Finish."

Name:	System cap
Description:	Policy for power capping a system
Policy type:	System power capping
Activate power capping:	Yes
Power cap type:	Absolute value (Watts)
Power cap value:	1400W

At the bottom of the wizard, there are four buttons: "< Back", "Next >", "Finish", and "Cancel". A mouse cursor is pointing at the "Finish" button.

The browser status bar at the bottom shows "Done" on the left and "sq02.dfw.ibm.com:8422" with security icons on the right.

Creating a Power Policy (6 of 6)

IBM Systems Director - Mozilla Firefox: IBM Edition

File Edit View History Bookmarks Tools Help

IBM Systems Director Welcome demo Help Logout IBM.

Active Ener... x Power Policies x --- Select Action ---

Power Policies

Use power policies to set power caps and power savings for individual resources or groups of resources.

Target Resources

IBM 8204 E8A 100D9C2 Browse...

Policies

Create policy... Create like... Edit policy... Delete Apply Actions Search the table... Search

Select	Name	Type	Targets	Description
<input checked="" type="checkbox"/>	System cap	System power capping		Policy for power capping a sy...

Page 1 of 1 1 Selected: 1 Total: 1 Filtered: 1

Done sq02.dfw.ibm.com:8422

Change Power Policy (1)

IBM Systems Director - Mozilla Firefox: IBM Edition

File Edit View History Bookmarks Tools Help

IBM® Systems Director Welcome root Help | Logout IBM.

Power System... x Active Ener... x Trend Data(1) x Trend Data(2) x Power Policies x --- Select Action ---

Power Policies

Use power policies to set power caps and power savings for individual resources or groups of resources.

Target Resources

Power550 Systems Browse...

Policies

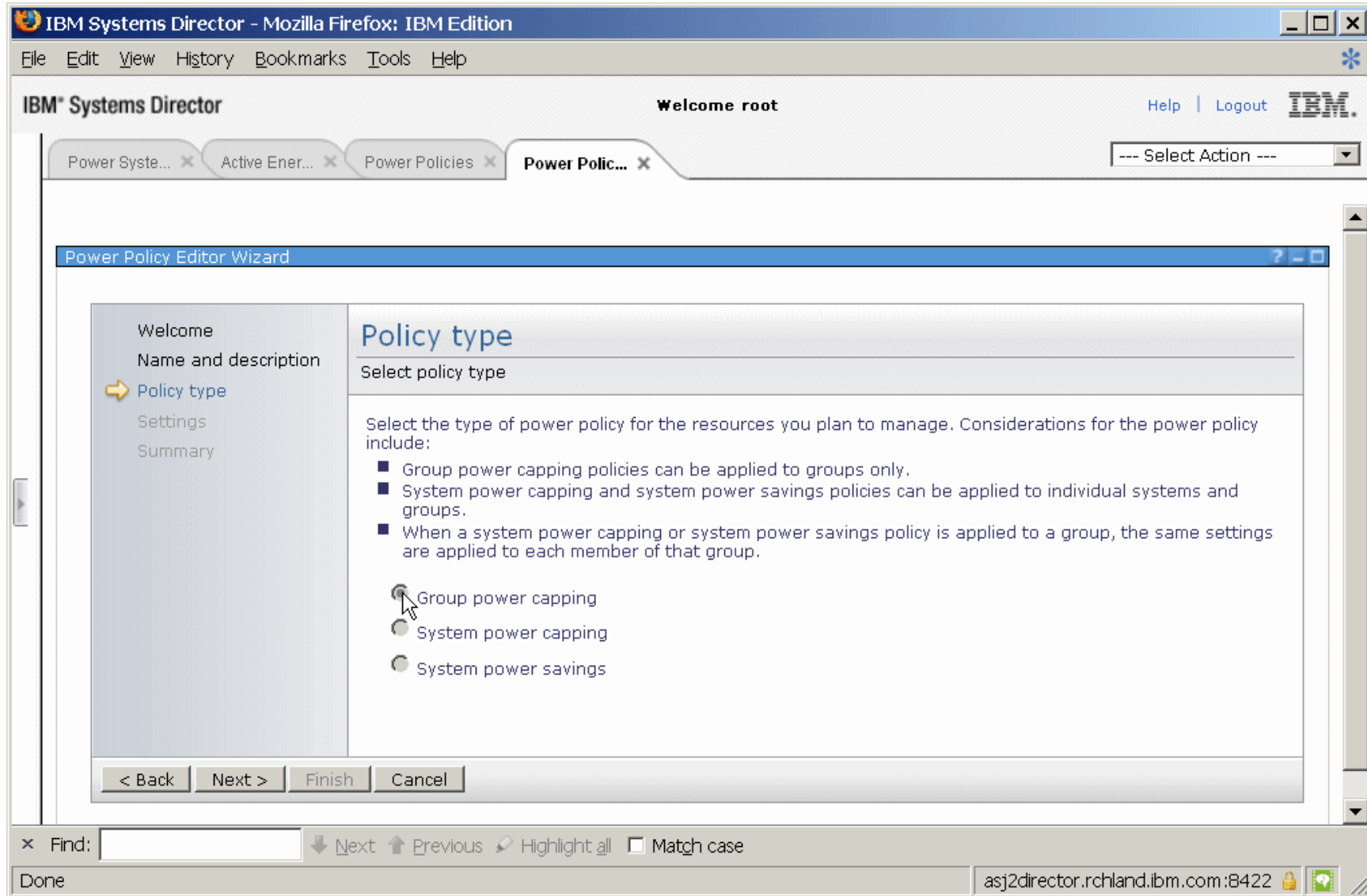
Create policy... Create like... Edit policy... Delete Apply Actions Search the table... Search

Select	Name	Type	Targets	Description
<input checked="" type="checkbox"/>	Power Cap Power550	Group power capping	Power550 Systems	Policy for capping Power550 g...
<input type="checkbox"/>	Simple Power Cap	System power capping		Set a power cap on a single s...

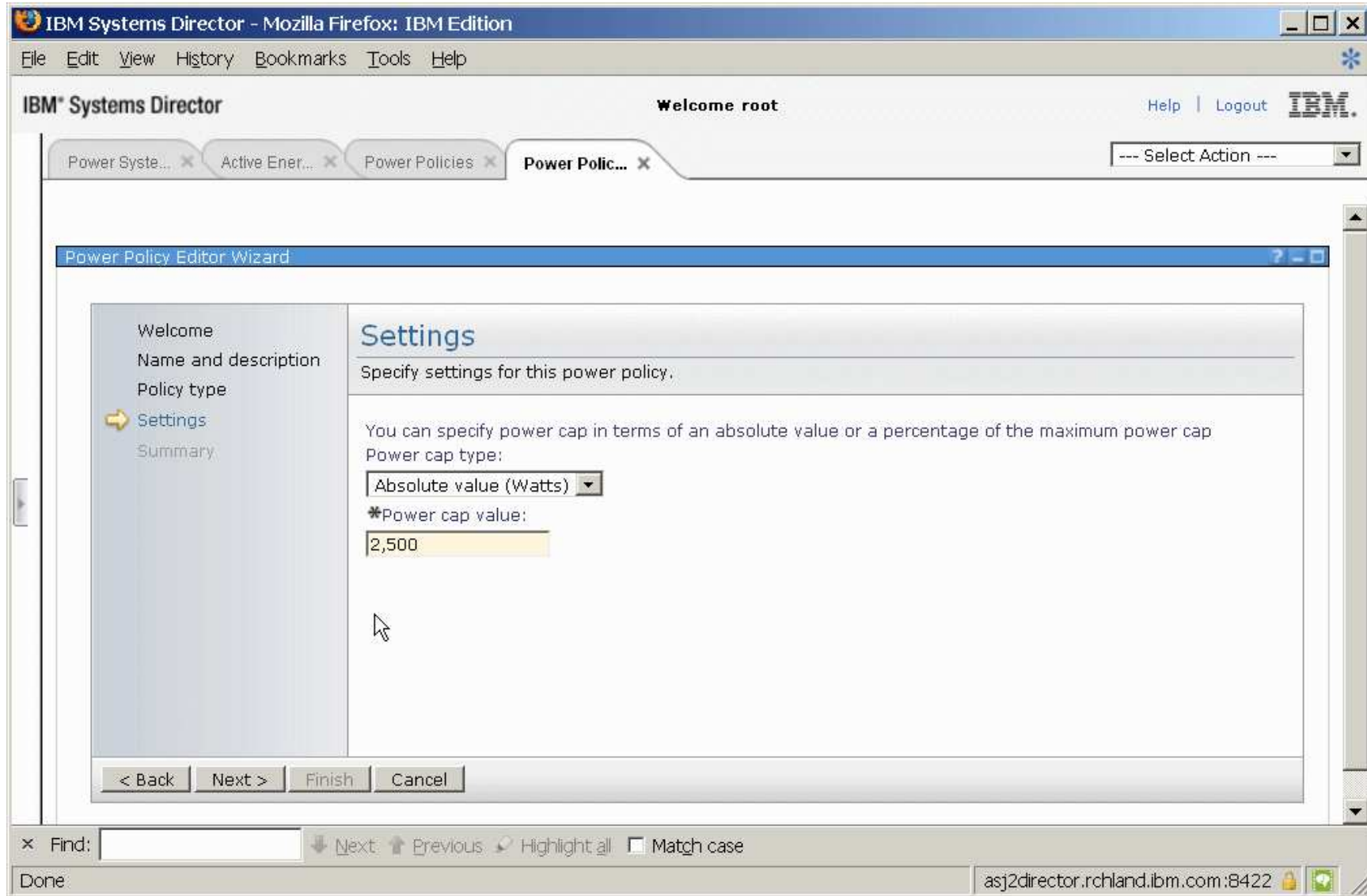
Page 1 of 1 1 Selected: 1 Total: 2 Filtered: 2

Done asj2director.rchland.ibm.com :8422

Group Policy (1)



Group Policy (2)



Applying a Power Policy (1)

IBM Systems Director - Mozilla Firefox: IBM Edition

File Edit View History Bookmarks Tools Help

IBM® Systems Director Welcome root Help Logout IBM.

Power System... Active Ener... Power Policies --- Select Action ---

Power Policies

Use power policies to set power caps and power savings for individual resources or groups of resources.

Target Resources

Power550 Systems Browse...

Policies

Create policy... Create like... Edit policy... Delete Apply Actions Search the table... Search

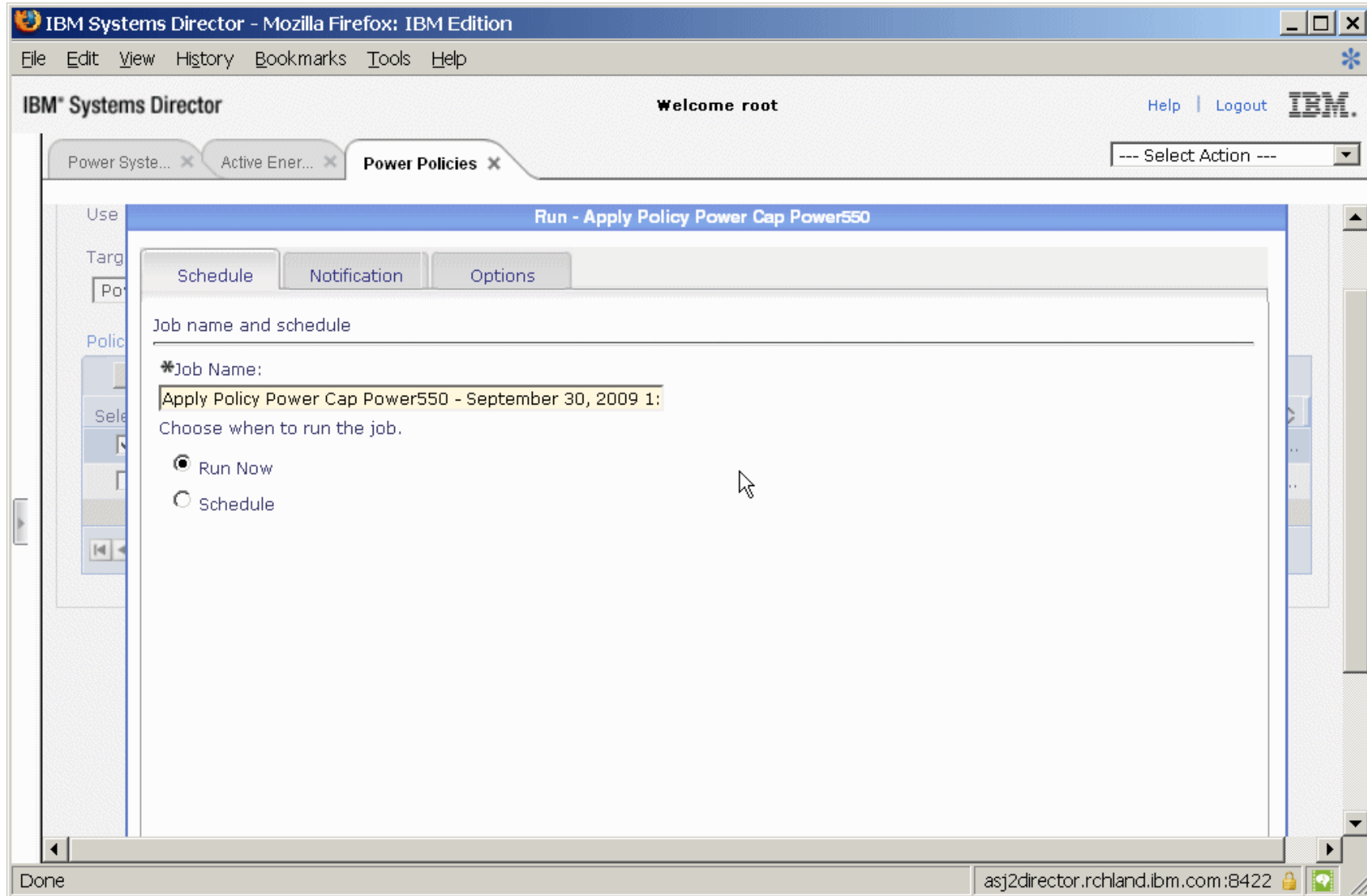
Select	Name	Type	Targets	Description
<input type="checkbox"/>	P550 1600	Group power capping		Cap Power550 servers at 1600 ...
<input checked="" type="checkbox"/>	P550 2500	Group power capping		Cap Power550 servers at 2500 ...
<input type="checkbox"/>	Simple Power Cap	System power capping		Set a power cap on a single sys...

Page 1 of 1 1 Selected: 1 Total: 3 Filtered: 3

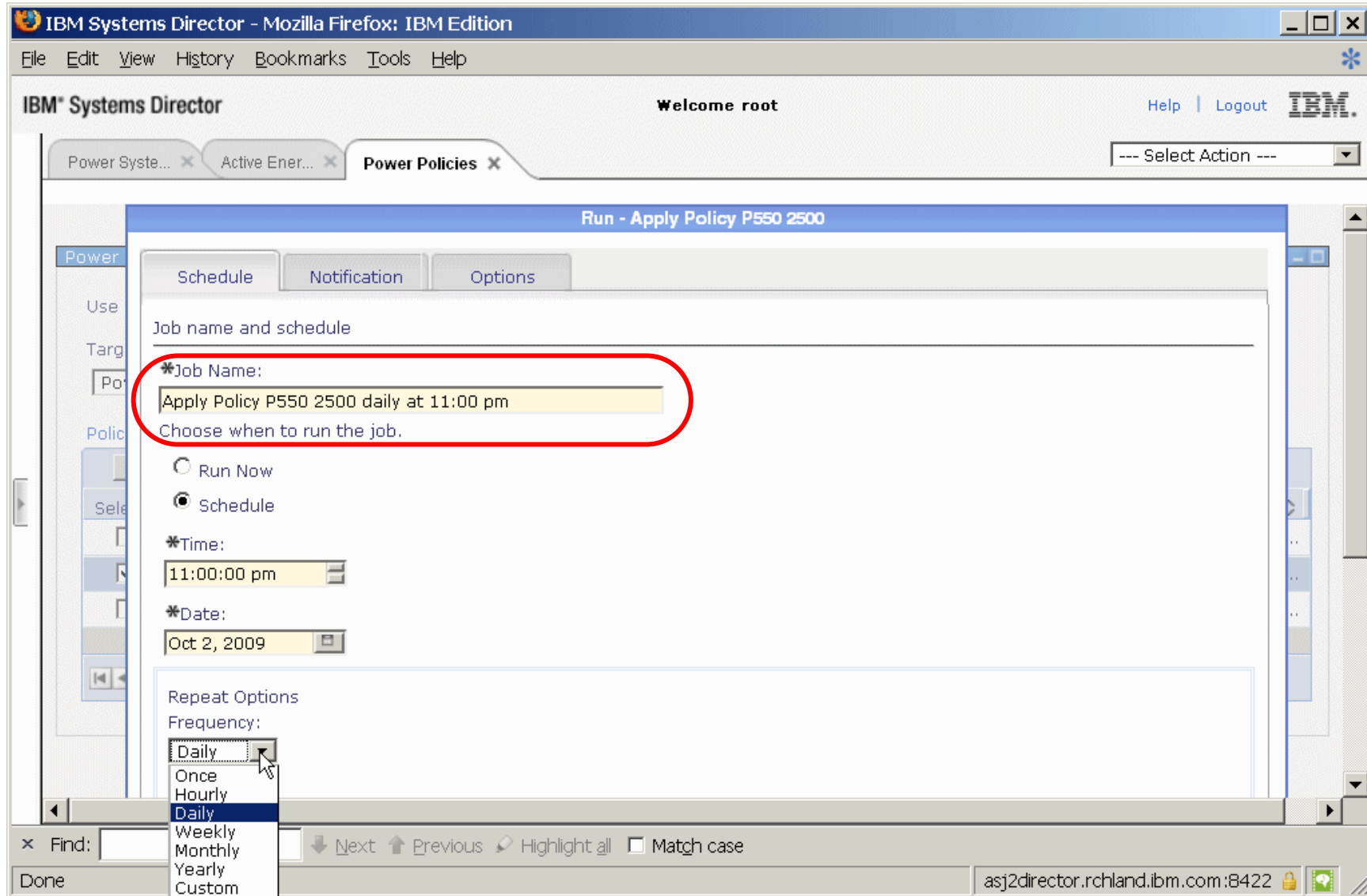
Find: Next Previous Highlight all Match case

Done asj2director.rchland.ibm.com:8422

Applying a Power Policy (2)



Applying a Power Policy (3)



View Trend Data

The screenshot shows the IBM Systems Director web interface in Mozilla Firefox. The page title is "IBM Systems Director - Mozilla Firefox: IBM Edition". The main content area is titled "Monitor" and contains instructions for navigating resources. A table of "Active Energy Manager Resources (View Members)" is displayed with columns for Select, Name, Type, Description, Average In..., Average O..., and Ambient Te... Two rows are selected, indicated by red circles around their checkboxes. A context menu is open over the table, with the "View trend data" option highlighted by a red circle. Below the table, there are navigation controls showing "Page 2 of 3" and "Selected: 2 Total: 11 Filtered: 11".

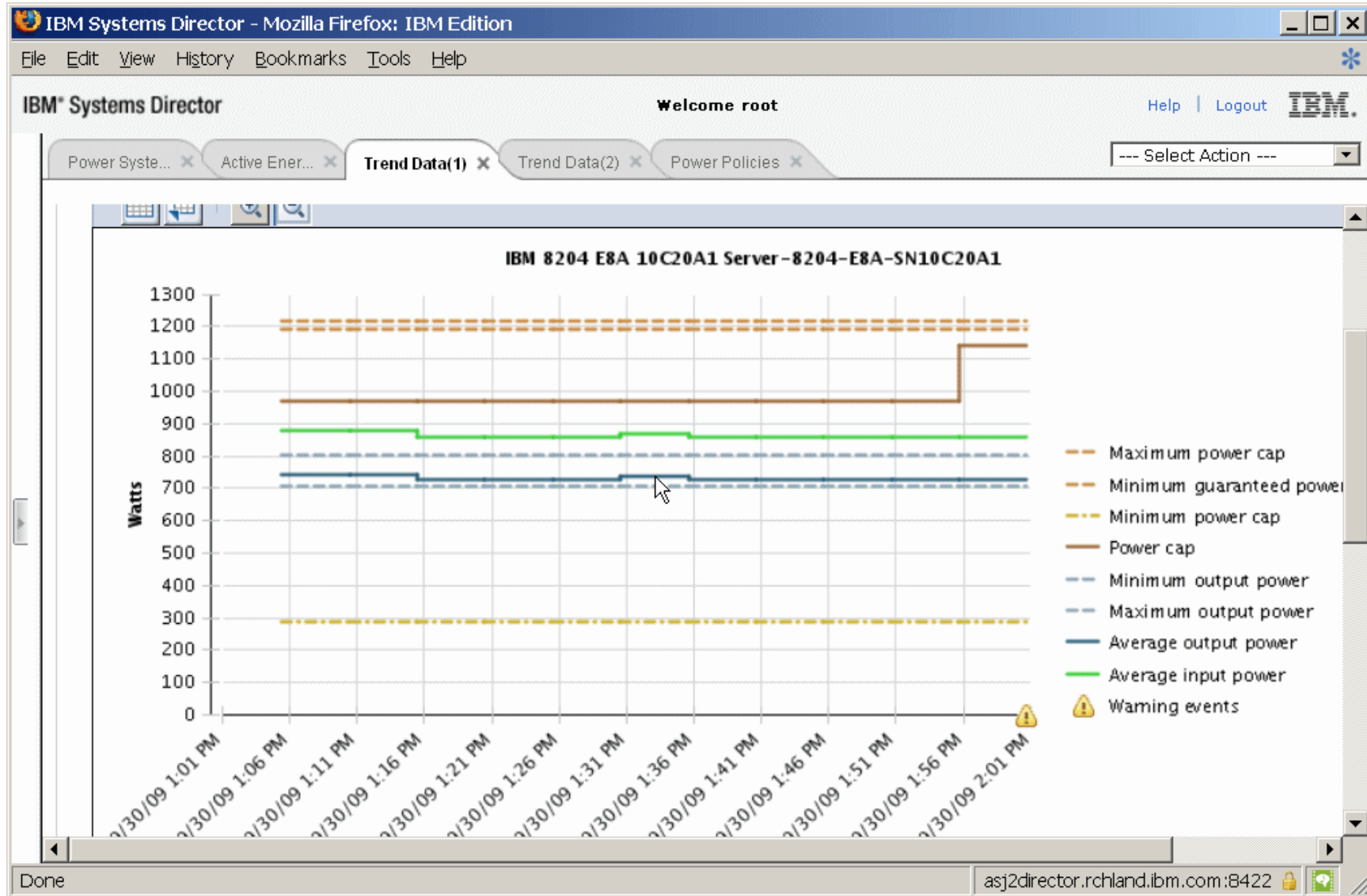
Monitor Tasks

- View trend data
- Calculate energy cost
- View Active Energy monitors

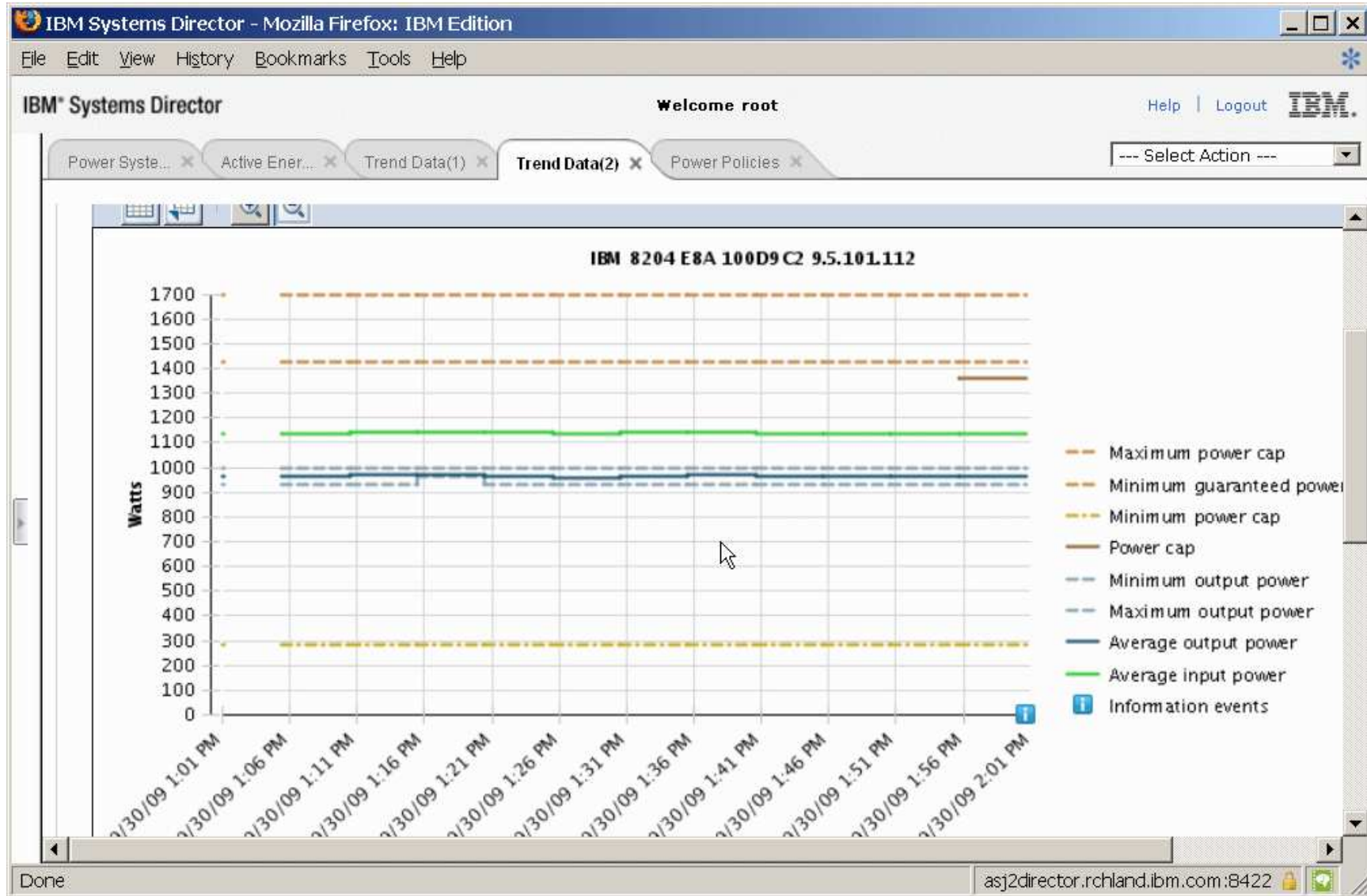
Select	Name	Type	Description	Average In...	Average O...	Ambient Te...
<input type="checkbox"/>	5886(B-L)	Logical Module	Logical Module			
<input type="checkbox"/>	IBM 8204 E8A 100D9C2 9.5....	Server	CEC			
<input checked="" type="checkbox"/>	IBM 8204 E8A 100D9C2 9.5....	Server	CEC	1,138.516	964.846	22
<input checked="" type="checkbox"/>	IBM 8204 E8A 10C20A1 Ser...	Server		859.661	728.528	23

Page 2 of 3 | 2 | Selected: 2 Total: 11 Filtered: 11

View Trend After First Policy – System C20A1



View Trend After First Policy – System 09DC2



Manage Power Capping (1)

The screenshot shows the IBM Systems Director web interface in Mozilla Firefox. The browser title is "IBM Systems Director - Mozilla Firefox: IBM Edition". The page header includes "IBM Systems Director" and "Welcome root" with links for "Help" and "Logout". There are several tabs open: "Power System...", "Active Ener...", "Trend Data(1)", "Trend Data(2)", and "Power Policies". A dropdown menu is open over a table of resources, showing the "Manage" option selected, which has further opened a sub-menu with "Power Capping" highlighted.

Active Energy Manager Resources (View Members)

Select	Name	Type	Description	Average In...	Average O...	Ambient Te...
<input type="checkbox"/>	5886(B-L)	Logical Module	Logical Module			
<input type="checkbox"/>	IBM 8204 E8A 100D9C2 9.5...					
<input checked="" type="checkbox"/>	IBM 8204 E8A 100D9C2 9.5...			1,049.385	889.311	22
<input type="checkbox"/>	IBM 8204 E8A 10C20A1 Ser...			866.34	734.188	23

Page 2 of 3

Manage

Set power caps and power savings mode. Control environmental metering devices.

The number of resources using power management:

Currently	Today
1 Power cap	1 Power cap
1 Power savings	1 Power savings

Management Tasks:

- Energy Cost Calculator
- Trend Data
- Manage Power
 - Power Capping
 - Power Savings
- Work with power policies
- Set power cap
- Set power savings options
- Configure metering device

Footer: javascript:menuItemLaunchAction(); asj2director.rchland.ibm.com:8422

Manage Power Capping (2)

The screenshot shows the IBM Systems Director web interface in Mozilla Firefox. The main content area is titled "Power Capping" and displays a warning message for target group "AEECON043W". The message states: "Some of the resources in the target group are under a power capping policy." Below the message, there are radio buttons for "Activate Power Capping" (selected) and "Deactivate Power Capping". The "Power cap type" is set to "Absolute value (Watts)". A slider shows the "Power cap value" set to 857W, with a range from 287W to 1,695W. A note indicates "Values between 287W and 1,423W are not guaranteed". A table lists the targets:

Name	Current power cap	Power Capping
IBM 8204 E8A 100D9C2 9.5.10...	None	Under a power policy

At the bottom of the interface, there is a pagination control showing "Page 1 of 1" and "Total: 1".

AEECON043W Some of the resources in the target group are under a power capping policy.

If any of the targets is under a power capping policy, the power capping settings will not be saved for those resources. In these cases, the settings can still be selected for the rest of the target resources.

Check the list of targets to see which resources are under a power capping policy.

Removing a Power Policy (1)

The screenshot shows the IBM Systems Director web interface in Mozilla Firefox. The browser title is "IBM Systems Director - Mozilla Firefox: IBM Edition". The page header includes "IBM Systems Director", "Welcome root", and "Help | Logout IBM.". There are tabs for "Power System...", "Active Ener...", and "Power Policies". A dropdown menu shows "--- Select Action ---".

The main content area is titled "Power Policies" and includes the instruction: "Use power policies to set power caps and power savings for individual resources or groups of resources." Below this is a "Target Resources" section with a dropdown menu set to "Power550 Systems" and a "Browse..." button.

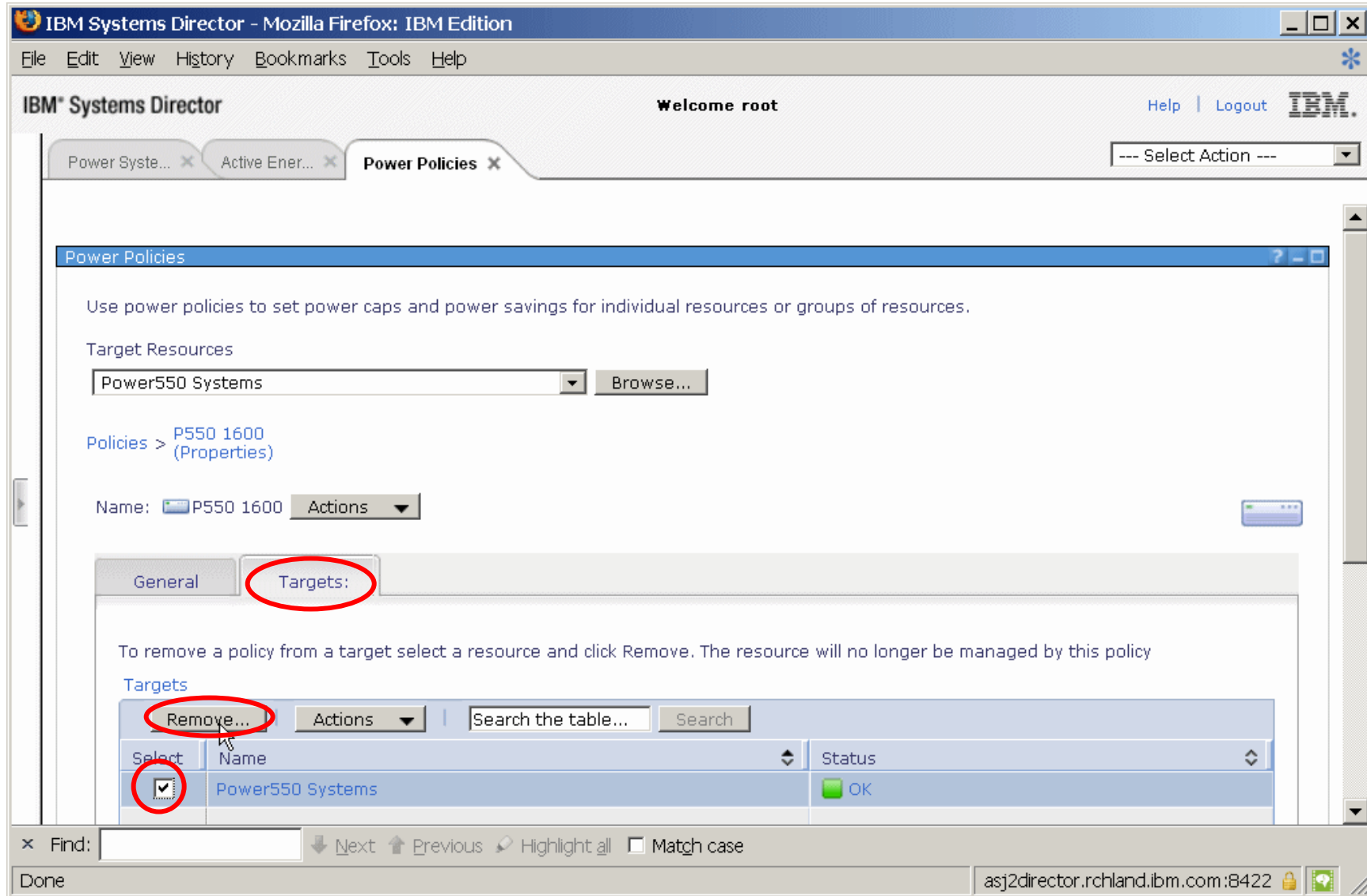
The "Policies" section contains a table with the following data:

Select	Name	Type	Targets	Description
<input checked="" type="checkbox"/>	P550 1600	Group power capping	Power550 Systems	Cap Power550 servers at 1600 wa...
<input type="checkbox"/>	P550 2500	Group power capping		Cap Power550 servers at 2500 wa...
<input type="checkbox"/>	Simple Power Cap	System power capping		Set a power cap on a single syste...

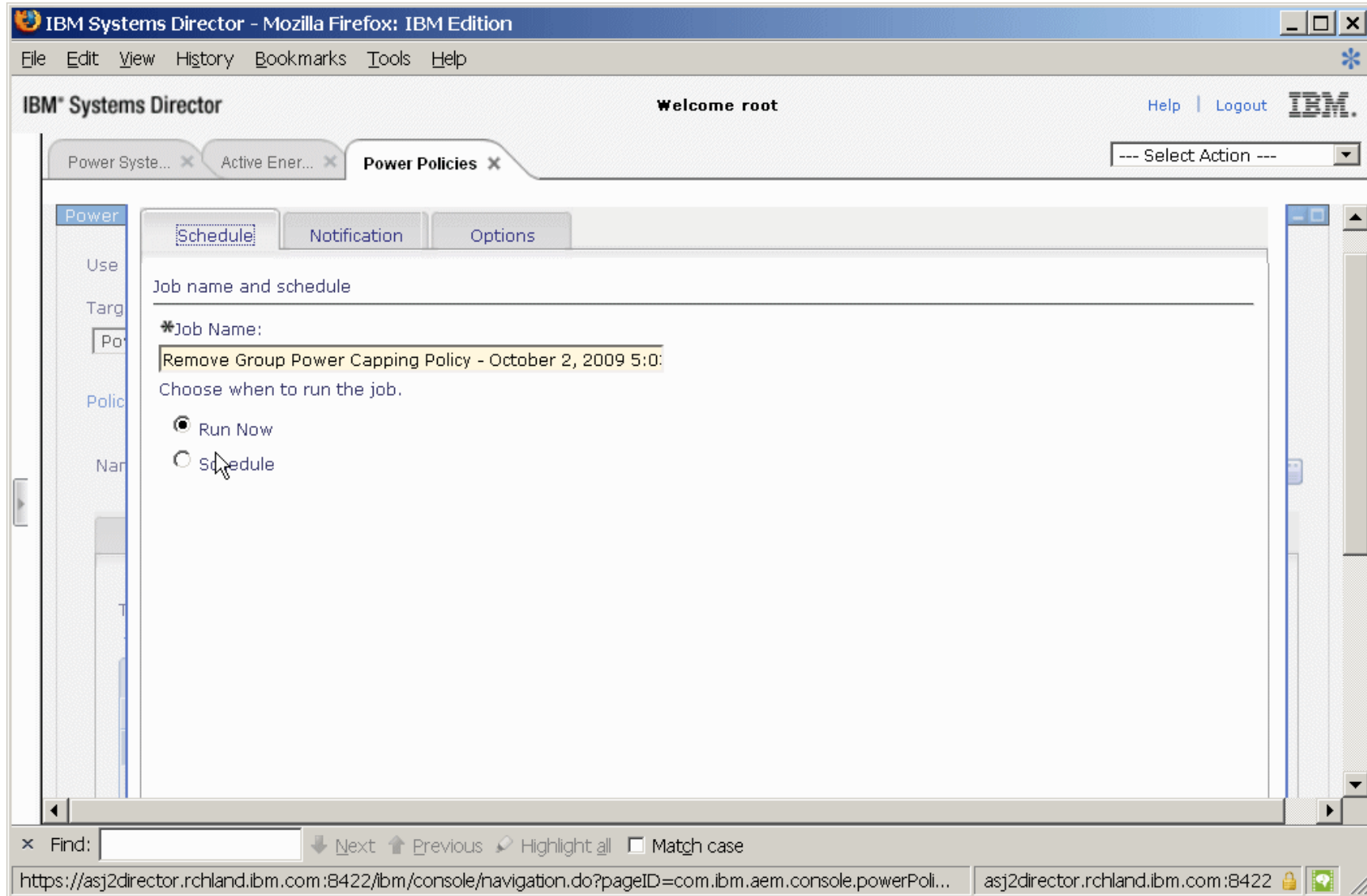
A red circle highlights the first row of the table, and a mouse cursor is pointing at the "Properties" button next to the "P550 1600" policy name. Below the table is a pagination bar showing "Page 1 of 1", "Selected: 1", "Total: 3", and "Filtered: 3".

The footer of the browser window shows a search bar, navigation buttons (Next, Previous, Highlight all, Match case), and the URL: "https://asj2director.rchland.ibm.com:8422/ibm/console/taskbar.do?ISC.closePage=com.ibm.usmi.console.sched...".

Removing a Power Policy (2)



Removing a Power Policy (3)



Changing a Power Cap

IBM Systems Director - Mozilla Firefox: IBM Edition

File Edit View History Bookmarks Tools Help

IBM Systems Director Welcome root Help Logout IBM.

Power System... Active Ener... Power Capping... --- Select Action ---

Power Capping

Choose either an absolute power cap, or a percentage of the available power cap.

Activate Power Capping Deactivate Power Capping

Power cap type:
Absolute value (Watts)

Power cap value:
287W 1,695W 1047W

Values between 287W and 1,423W are not guaranteed

Targets:

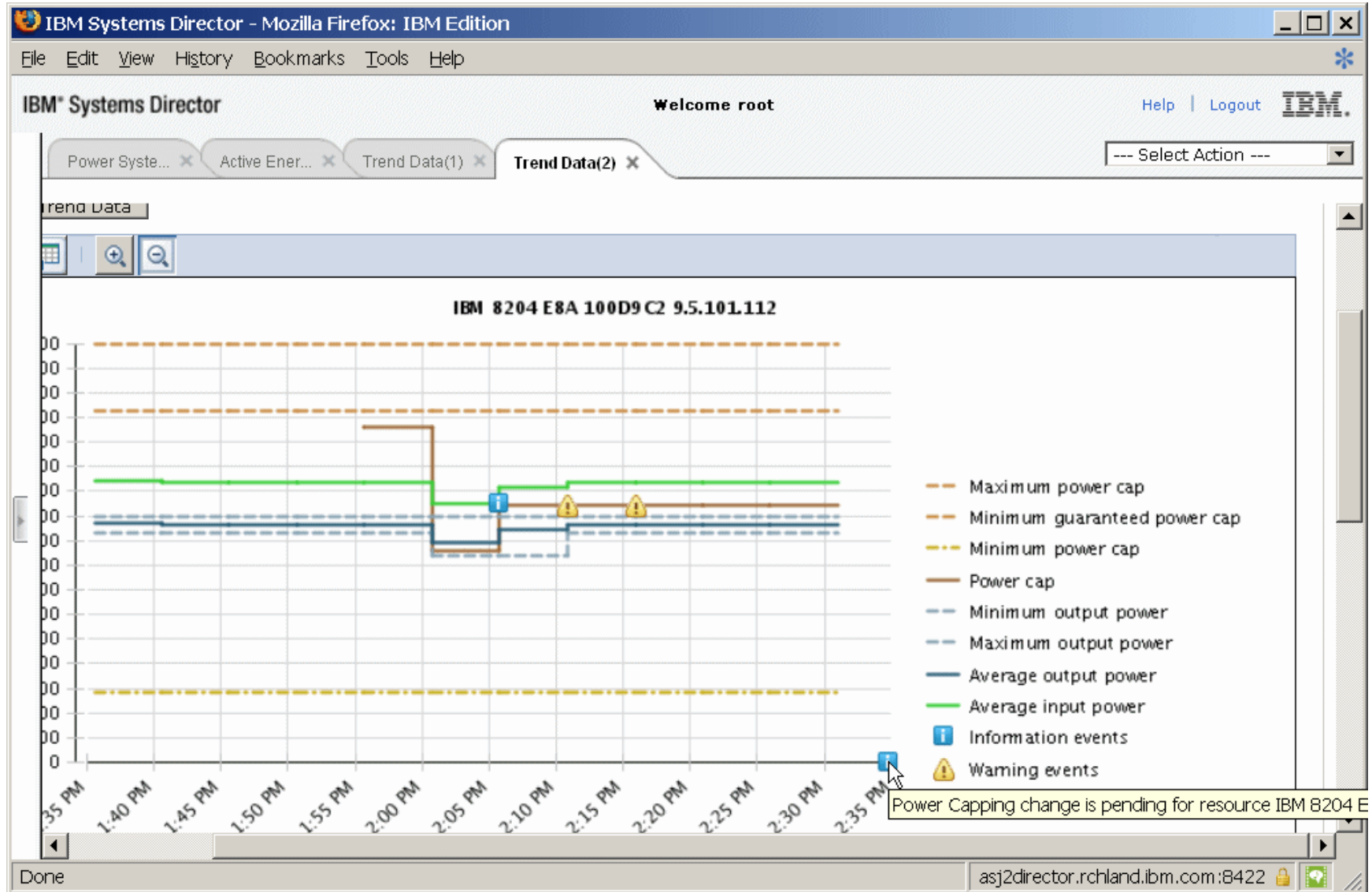
Name	Current power cap	Power Capping
IBM 8204 E8A 100D9C2 9.5.10...	None	Inactive

Page 1 of 1 1 Total: 1

Save Close

Done asj2director.rchland.ibm.com:8422

Trend After Most Changes – System 0D9C2



Deactivating Power Capping

Choose either an absolute power cap, or a percentage of the available power cap.

Activate Power Capping Deactivate Power Capping

Power cap type:
Absolute value (Watts)

Power cap value:
287W 1,695W W

Values between 287W and 1,423W are not guaranteed

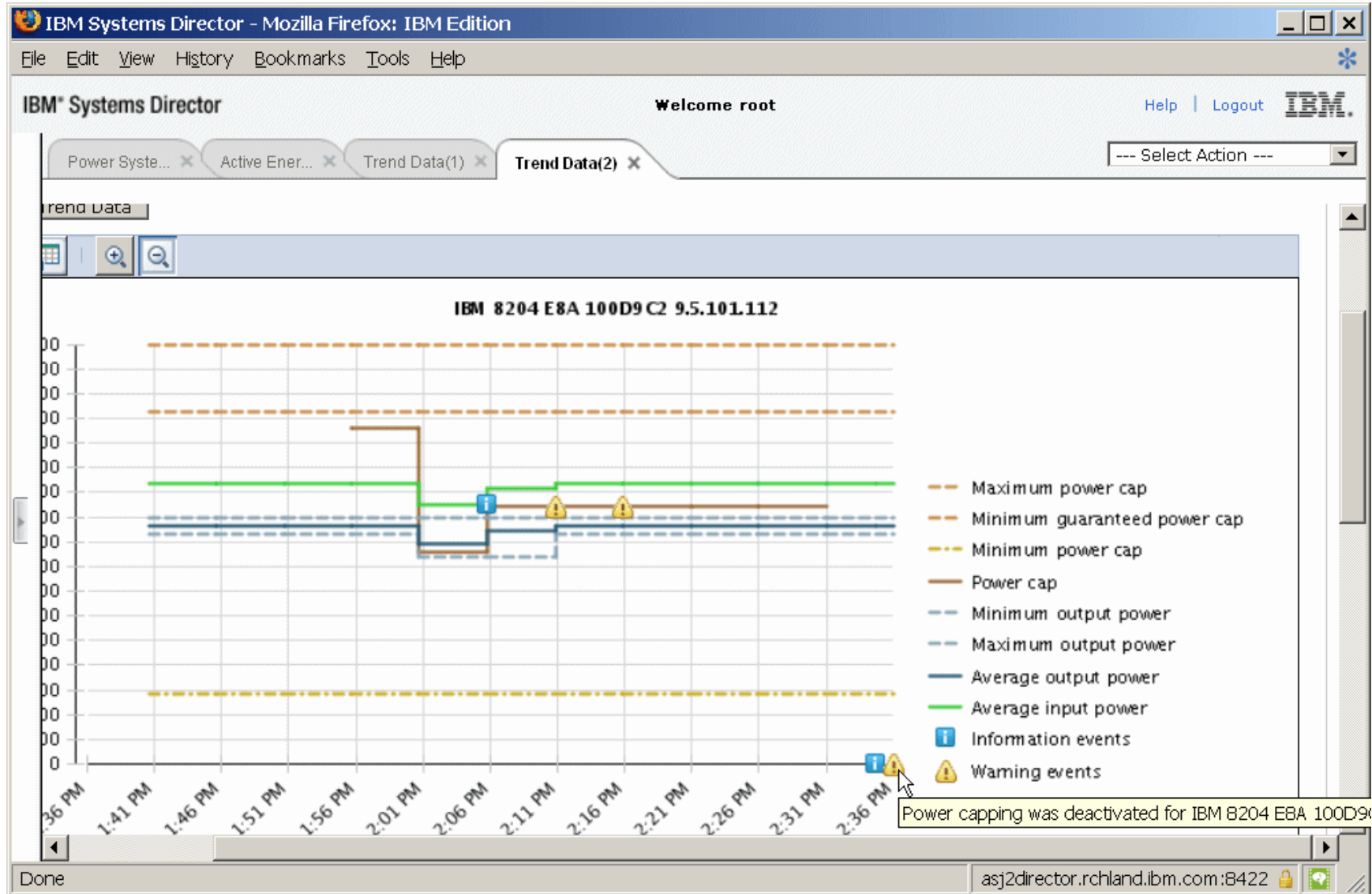
Targets:

Name	Current power cap	Power Capping
IBM 8204 E8A 100D9C2 9.5.10...	1,046W (53.90%)	Active

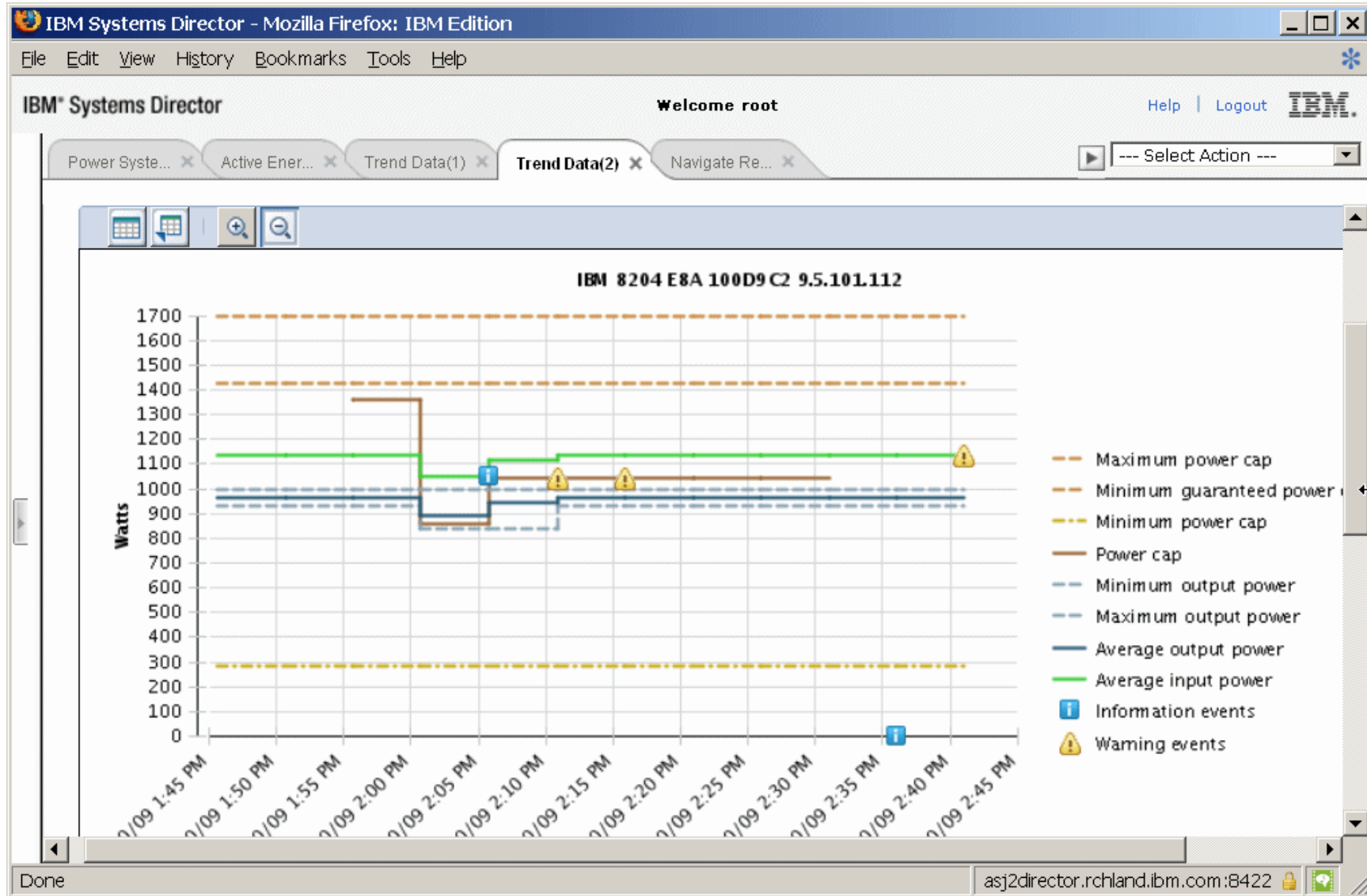
Page 1 of 1 1 Total: 1

Save Close

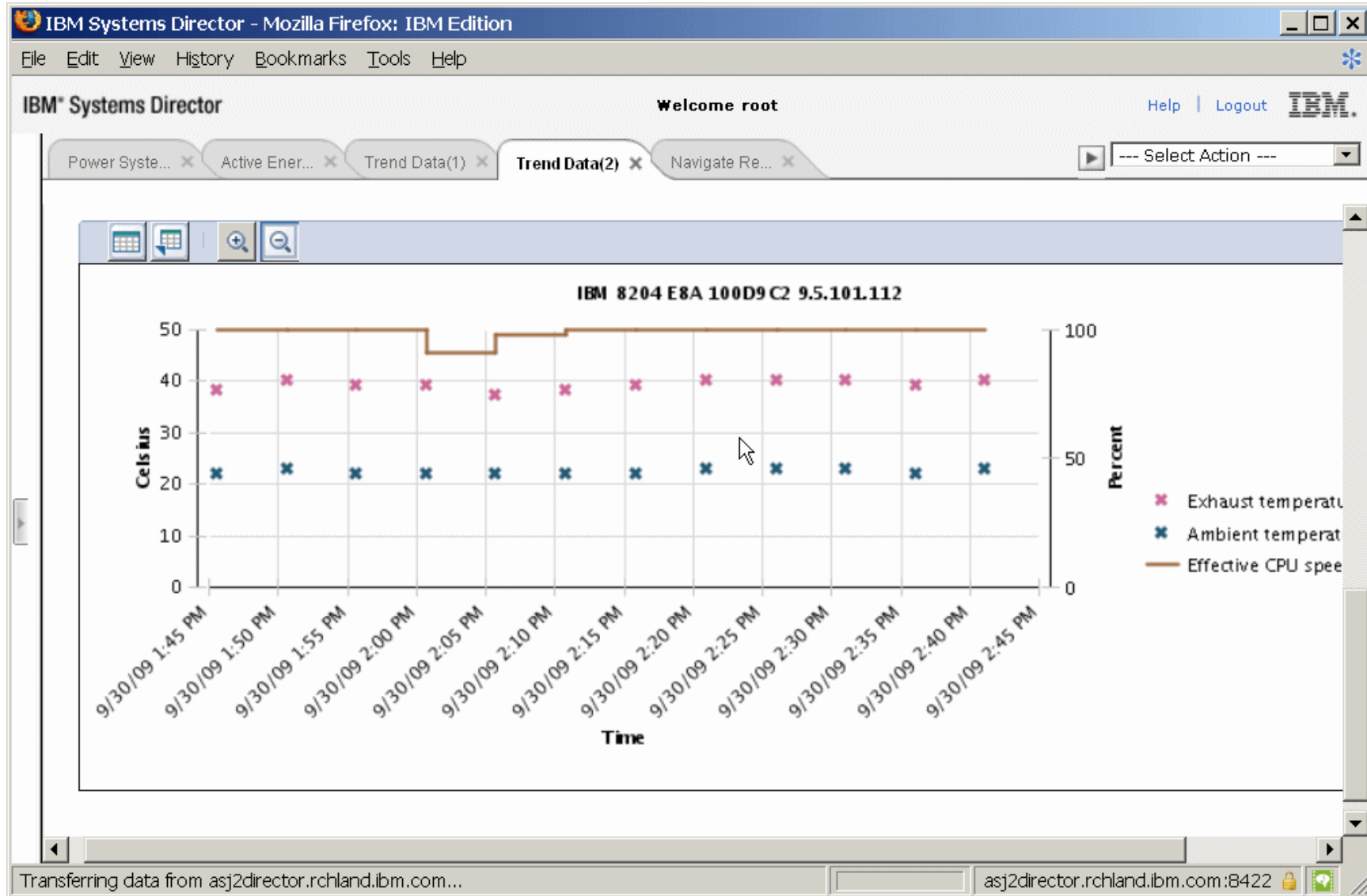
Trend After ALL Changes – System 0D9C2



Trend Data – Custom Time Interval (1)



Trend Data – Custom Time Interval (2)



Trend Data Export for System 0D9C2

Start Time	Stop Time	Average Input Power	Average Output Power	Minimum Output Power	Maximum Output Power	Power Cap	Minimum Power Cap	Minimum Guaranteed Power Cap	Maximum Power Cap	Event Text	Event Severity
1:45 PM	1:50 PM	1,137.56	964.037	932	996		287	1,423	1,695		
1:50 PM	1:55 PM	1,138.52	964.846	932	996		287	1,423	1,695		
1:55 PM	2:00 PM	1,136.04	962.746	932	996	1,358	287	1,423	1,695		
2:00 PM	2:05 PM	1,049.39	889.311	836	996	857	287	1,423	1,695		
2:00 PM	2:00 PM									Power capping was activated for IBM 8204 E8A 100D9C2 9.5.101.112	Information
2:05 PM	2:10 PM	1,113.23	943.415	836	996	1,046	287	1,423	1,695		
2:05 PM	2:05 PM									The power cap value for IBM 8204 E8A 100D9C2 9.5.101.112 changed from 1358 watts (4633 BTUs) to 857 watts (2924 BTUs)	Warning
2:10 PM	2:15 PM	1,134.15	961.144	932	996	1,046	287	1,423	1,695		
2:10 PM	2:10 PM									The power cap value for IBM 8204 E8A 100D9C2 9.5.101.112 changed from 857 watts (2924 BTUs) to 1046 watts (3568 BTUs)	Warning
2:15 PM	2:20 PM	1,134.19	961.179	932	996	1,046	287	1,423	1,695		
2:20 PM	2:25 PM	1,134.96	961.836	932	996	1,046	287	1,423	1,695		
2:25 PM	2:31 PM	1,137.02	963.58	932	996	1,046	287	1,423	1,695		
2:31 PM	2:36 PM	1,137.43	963.923	932	996		287	1,423	1,695		
2:34 PM	2:34 PM									Power Capping change is pending for resource IBM 8204 E8A 100D9C2 9.5.101.112	Information
2:36 PM	2:41 PM	1,135.77	962.521	932	996		287	1,423	1,695		
2:36 PM	2:36 PM									Power capping was deactivated for IBM 8204 E8A 100D9C2 9.5.101.112	Warning

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