



# ENERGY STAR Program Requirements for Computer Servers

## Computer Servers Version 2.0 Kickoff March 4, 2013

**U.S. Environmental Protection Agency  
U.S. Department of Energy**



Learn more at [energystar.gov](http://energystar.gov)

# Webinar Details

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- Webinar and application materials will be posted to [www.energystar.gov/CBresources](http://www.energystar.gov/CBresources)
- Audio provided via conference call in:
  - U.S. or Canada: (877) 668-4493
  - International: (650) 479-3208
  - Participant Code: 922528367
- Phone lines will remain open during discussion
- Please keep phone lines on mute unless speaking
- Refer to the agenda for approximate discussion timing

# Agenda

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- Certification Body Training and Specification Overview
- Break for Q&A
- Schedule and Milestones
- Break for Lunch
- International Scope
- Test Procedure Q&A

# Webinar Objectives

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1. Prepare certification body staff to evaluate Computer Server products for ENERGY STAR certification
2. Describe reporting requirements and data submission processes
3. Generally prepare stakeholders for important milestones for Servers v2.0 and answer questions on the specification and test procedure

# CB Training and Specification Overview

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# Scope: Included Products



Rack Mounted Servers



Pedestal Servers



Blade Servers



Multi-Node Servers

- The above products can be qualified as long as they contain no more than four sockets per computer server (or per blade or node in the case of blade or multi-node servers).

# Scope: Excluded Products



Large Servers



Server Appliances



Storage Products



High Performance Computing Systems



Network Equipment

- Fully fault tolerant servers are also excluded from scope

# Scope Evaluation



- How to determine if a product is in scope:

Product Attribute	 In Scope	 Out of Scope
Power Type	AC single phase, AC three phase	DC
Form Factor	Blade/Multi-node, Rack-mount, Tower/Pedestal	Mainframes, Supercomputers
Number of Sockets	<ul style="list-style-type: none"> <li>- Blade/Multi-node: <math>\leq 4</math> sockets per blade or node</li> <li>- Rack-mount or Tower/Pedestal: <math>\leq 4</math> sockets total</li> </ul>	<ul style="list-style-type: none"> <li>- Blade/Multi-node: <math>&gt; 4</math> sockets per blade or node</li> <li>- Rack-mount or Tower/Pedestal: <math>&gt; 4</math> sockets total</li> </ul>

# Additional Scope Evaluation



- If Rack-mount or Tower/Pedestal,



# Final Covered Product Types



- All are AC power only
- Blade servers:
  - $\leq 4$  socket per **blade**
- Multi-node servers
  - $\leq 4$  socket per **node**
- Rack-mount or Pedestal/Tower
  - 1 or 2 socket managed
  - 1 or 2 socket unmanaged
  - 1 or 2 socket resilient
  - 3 or 4 socket

# Final Covered Product Types

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- Note: All resilient servers are managed, but not all managed servers are resilient. Resilient status takes precedence over managed status for determining product type.

# Criteria by product type

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- All servers must meet:
  - Table 1: PSU efficiency
  - Table 2: PSU power factor
  - Section 3.3: Power management requirements
  - Section 3.5: Active state efficiency criteria



# Criteria by product type

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- Rack/pedestal, 1 or 2 socket:
  - Section 3.6: Idle state efficiency criteria
  - Table 3: Minimum idle levels
    - Broken down by managed, unmanaged, resilient
  - Table 4: Adders
    - Apply as relevant given installed hardware
    - Buffered memory adders apply only to resilient servers
  - Section 6.1.2: Servers that cannot populate all sockets for test must populate to max possible and meet idle power requirements for full number of sockets.
- Rack/pedestal, 3 or 4 socket:
  - Section 3.7: Idle state efficiency criteria
    - Measure idle levels

# Criteria by product type

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- Blade servers must meet:
  - Section 3.4: Thermal management and monitoring, shipping documentation
  - Section 3.8: Measure idle levels, per blade consumption
- Multi-node servers must meet:
  - Section 3.4: Thermal management and monitoring, shipping documentation
  - Section 3.9: Measure idle levels, per node consumption

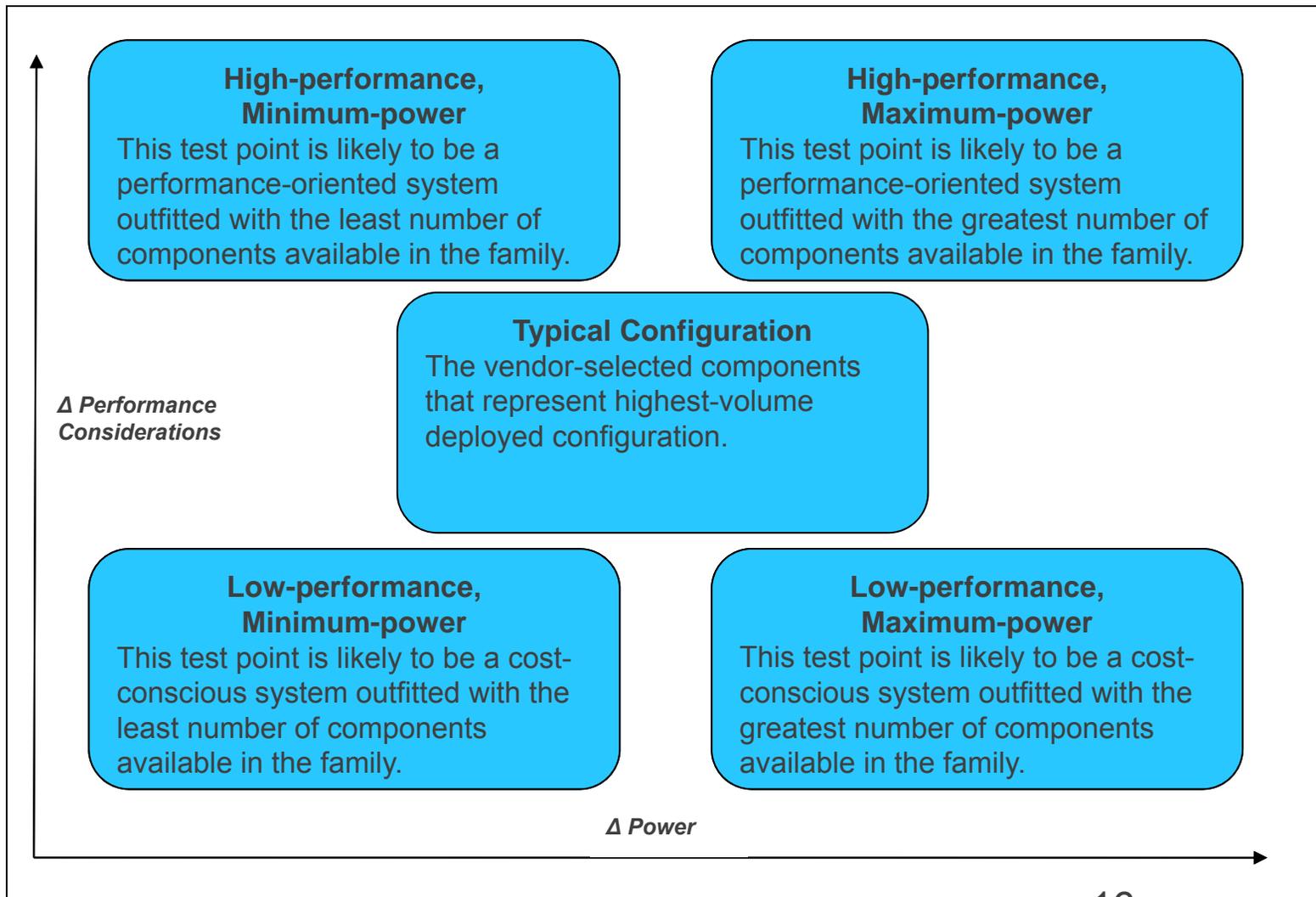
# Single Configurations and Product Families

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- For certification of a single configuration, manufacturers shall test that configuration only.
- For certification of a product family manufacturers shall select the configurations described in the following slides:

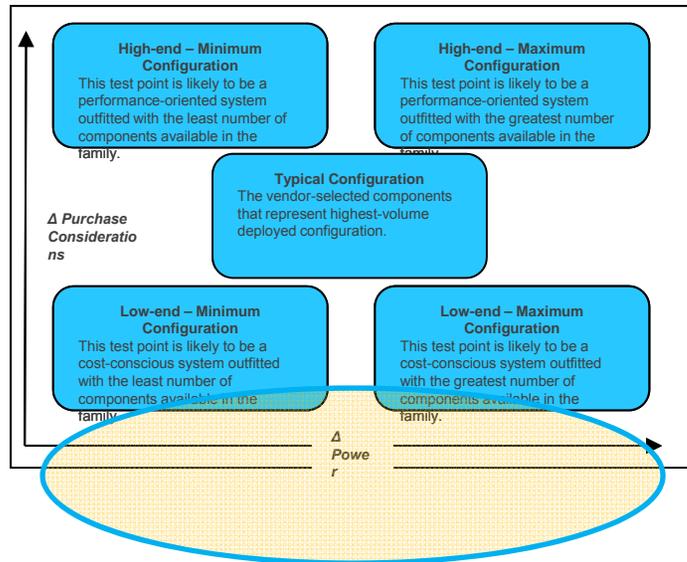
# Five Point Product Family Structure



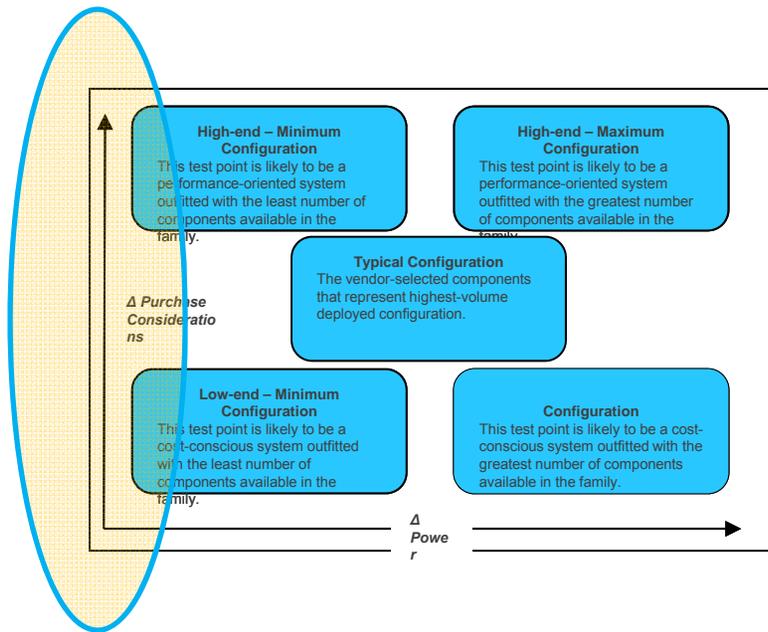
# Five Point Product Family Structure



- The horizontal axis represents shifts in power
  - **Minimum Power:** Minimum configuration that is able to boot and execute supported OSs
  - **Maximum Power:** Vendor-selected combination of components that maximize power usage within the product family once assembled and operated



# Five Point Product Family Structure



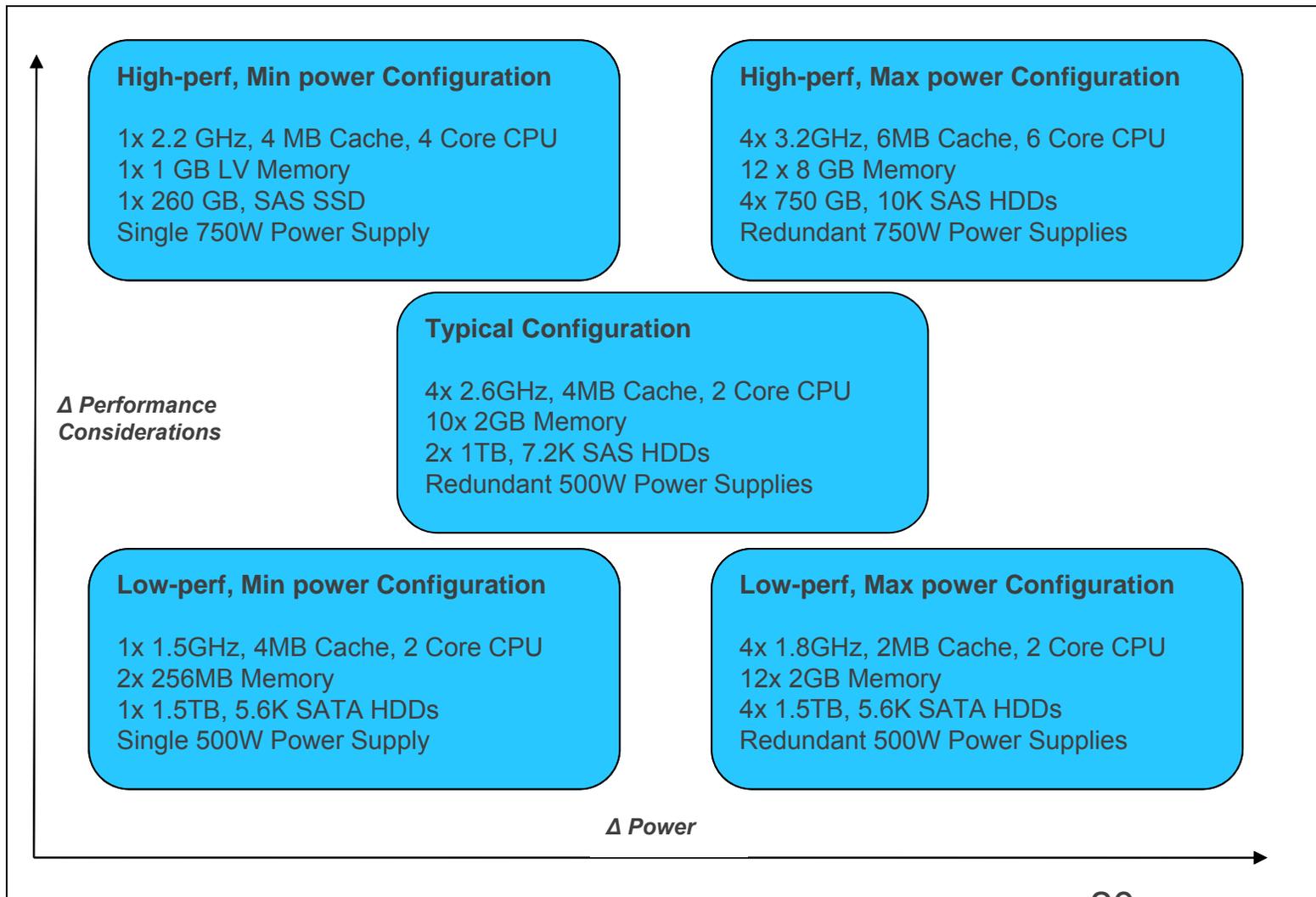
- The vertical axis represents shifts in performance priorities
  - **High-end:** higher-price or higher-performance computing platform
  - **Low-end:** Lower-price or lower-performance computing platform

# Example of Variability Within a Product Family



- Server Common Product Family  
Attributes: All products in family share these
  - Model Line: *A1234 Server*
  - Form Factor: *Rack-mounted*
  - Motherboard: Model *MB1203 w/ 4 CPU Sockets*
- CPU Options:
  - 1.5 GHz / 4MB Cache / 2 Core / 80W
  - 1.8 GHz / 2MB Cache / 2 Core / 80W
  - 2.2 GHz / 4MB Cache / 4 Core / 60W  
*Energy Optimized*
  - 2.6 GHz / 4MB Cache / 4 Core / 95W
  - 3.0 GHz / 6MB Cache / 4 Core / 95W
  - 3.2 GHz / 6MB Cache / 6 Core / 105W
- Memory Options (per DIMM):
  - 256 MB
  - 1 GB - LV (Low Voltage)
  - 2 GB
  - 8 GB
- Storage:
  - 750 GB / 10,000 RPM / SAS / 3.5"
  - 1 TB / 7,200 RPM / SAS / 3.5"
  - 1.5 TB / 5,600 RPM / SATA / 3.5"
  - 260 GB / SSD / SAS / 3.5"
- Power Supply:
  - 500 W Universal, Single or Redundant
  - 750 W Universal, Single or Redundant
- Other Characteristics:
  - 1 or 2 - (Single or Redundant) Power Supplies
  - 5 - I/O Expansion Slots
  - 4 - 3.5" HDD Slots
  - 12 - Memory (DIMM) Slots

# Example of Variability Within a Product Family



# Auxiliary Processing Accelerators (APAs)



- Idle state power data with APAs removed shall be used as  $P_{\text{BASE}}$  for the purposes of qualifying single configurations or product family test points.
- To qualify systems to be sold with APAs:
  - Single Configuration: Idle state testing conducted and submitted both with and without APAs installed.
  - Product Families: Idle state testing conducted and submitted both with and without APAs installed for the high performance, maximum power configuration.

# Auxiliary Processing Accelerators (APAs)

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- Product family APA requirements must be met fully for each APA that is intended to be sold with the product family as ENERGY STAR.
- The measured idle power consumption of each installed APA in a configuration shall not exceed 46 watts. This consumption shall be reported in the QPX for each APA qualified with a Computer Server.

# Questions

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- The line is now open to receive any questions related to evaluating Servers for certification, or for questions about the Servers specification.

# Reporting Requirements



A successful QPX test submission using the Computer Servers web service will be required for a CB to maintain recognition.

CBs shall report the following data to EPA which includes both tested and verified data and manufacturer provided information:

- General characteristics
- Electrical characteristics
- Active and idle power consumption and performance values for all tested configurations
- Available and enabled power savings features
- Thermal characteristics and air inlet temperature measurements
- List of qualified configurations, including SKUs or configuration IDs
- For blades, a list of compatible blade chassis that meet qualification criteria

***Fields are specified in the data reporting template (QPX). This template will be released for CB and stakeholder review in the March timeframe prior to being finalized.***

# Using the QPX

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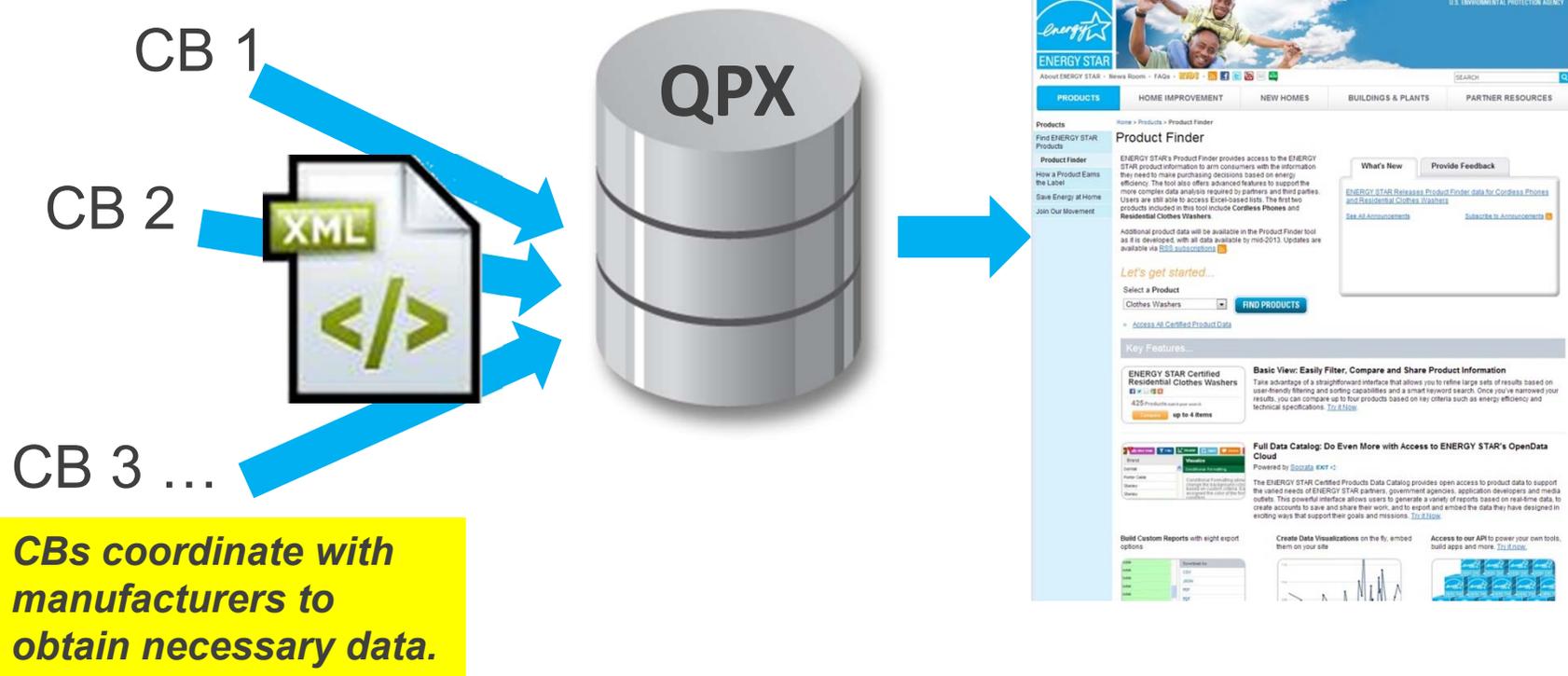


- Single configurations shall have data from one configuration provided in the QPX
- For product families with multiple configurations, all required testing configurations are reported in the same data submission
  - Additional data may be required for APAs

# Data Submission and Display



- Qualified Product Exchange (QPX) EPA-recognized certification bodies submit data
- Information displayed on ENERGY STAR Qualified Products List and searchable via Product Finder.



# Break for CB Test Method Q&A

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- The line is now open to receive any questions related to the test method.

# Milestones: Overview

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- Week of March 11<sup>th</sup>:
  - Release of Final Servers Version 2.0 Specification and Test Procedure
  - Release of draft QPX (data entry form) for review
- Mid-March to April:
  - ENERGY STAR processing of QPX, etc. documents.
- April:
  - First Version 2.0 products will appear on the ENERGY STAR Qualified Product List
- August: Version 1.1 testing stops.
- September 2013: Off-season meeting
- December 2013: Effective date.

# Milestones: March

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- EPA:
  - Week of March 11<sup>th</sup>: Final Servers v2.0 published
    - QPX doc distributed for review
  - Mid-March to April: Review, processing of QPX, administrative work
- Manufacturers/Partners:
  - Week of March 18<sup>th</sup>: May choose to begin testing to v2.0
  - March 29<sup>th</sup>: Submit feedback on EPA QPX
- CBs:
  - March 29<sup>th</sup>: Submit feedback on EPA QPX

# Milestones: April

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- EPA:
  - QPX review, processing complete
  - Begins accepting test result data from CBs
  - Products qualified to v2.0 begin showing up on ENERGY STAR Qualified Product List
- Manufacturers:
  - May continue testing to v2.0 (no change)
- CBs
  - Successfully test your XML system using the new Servers v2.0 web service.
  - CBs that do not successfully test the system will not maintain their EPA recognition for the new spec.

# Milestones: August

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- EPA:
  - August 30<sup>th</sup>: Stops accepting new product qualifications for Version 1.1.
  - Existing products from Version 1.1 remain listed on the Qualified Products List
- Manufacturers:
  - Must halt any v1.1 activities by August 30<sup>th</sup>
- CBs:
  - May not submit new data for v1.1 qualification starting August 30<sup>th</sup>

# Milestones: September

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## EPA and stakeholders:

- “Off season” meeting
  - SERT data review
  - SERT expansion possibilities, updates
    - DC power
    - New architectures
    - APAs
  - SERT test run time
  - Testing and reporting of server thermal characteristics
  - Power management capabilities of computer servers
  - Auxiliary Processing Accelerators (APAs)
  - International Outreach
- Open to additional suggestions for agenda

# Milestones: December

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Effective date in mid-December

- EPA:
  - Remove all Version 1.1 data from its Qualified Product List
  - Version 2.0 is now the only data listed online
  - “Unmask” anonymous SERT data
- Manufacturers
  - All products must be qualified to Version 2.0 to get the ENERGY STAR label.
  - Stop marketing products as ENERGY STAR that were ONLY qualified under Version 1.1.

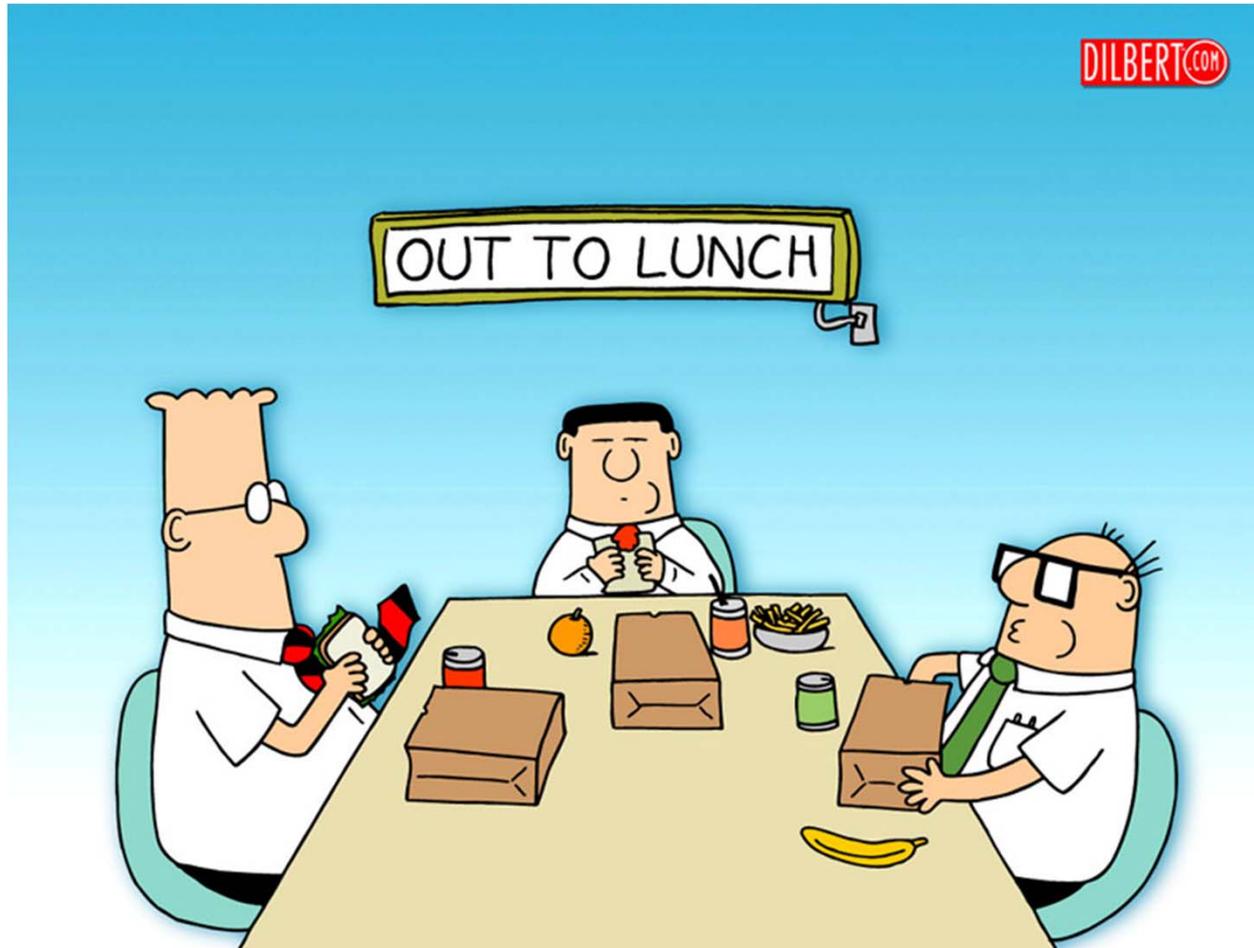
# Q&A on Milestones

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- Pause for questions

# Lunch break



# ENERGY STAR Servers

## International Scope

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- EU:
  - New agreement for coordination of energy efficiency programs includes servers
  - In force as of February 20<sup>th</sup>, 2013
- South Korea:
  - Plans to use SERT for national energy efficiency program
- China:
  - Evaluating SERT for use
  - US-China Clean Energy Framework
- Japan:
  - Evaluating SERT for use
- Canada:
  - NRCAN will use ENERGY STAR Servers Version 2.0, plus SERT
- European Free Trade Association
- Australia
- New Zealand

# ENERGY STAR Servers International Scope

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- ENERGY STAR can actively promote in international community over the summer and fall.
  - Workshop, calls, etc.

# Test Procedure Discussion, Q&A

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# Contact Information



Please send all questions to:

- Certification: [certification@energystar.gov](mailto:certification@energystar.gov)
- Technical Assistance: [servers@energystar.gov](mailto:servers@energystar.gov)

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# References and Resources

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- Certification Body Resources (including application form):  
[www.energystar.gov/CBresources](http://www.energystar.gov/CBresources)
- ENERGY STAR UPS specification development:  
Go to [www.energystar.gov/NewSpecs](http://www.energystar.gov/NewSpecs) and Click on  
“Enterprise Servers”