

Smarter technology for a smarter planet.

IBM Tivoli® Endpoint Manager
built on BigFix technology

Console Operator Best Practices

Delivering optimal Business Value through
effective system use





Best Practices

Console and Web Reports





TEM and Data

- TEM Console and Web Reports both provide windows into the same data in BigFix
- The Console is relatively heavier than Web Reports in the consumption of resources. Using the console creates communication with the TEM Server, the TEM database, and potentially ALL machines in the deployment
- Web reports communicates ONLY with the TEM database



TEM and Data

- Use the TEM Console when:
 - You need to take action to achieve a desired result
 - You need to maintain the components of the system

- Use Web Reports when:
 - You need to view data, but not take action
 - You need to manipulate or export data





TEM Administration Best Practices

- TEM supports two types of Console Operators
 - Master Operators
 - Non-master Operators
- Everyone with Console access should have a non-Master operator login
 - Create Roles within BigFix to support the required separation of duties
 - Assign Roles to respective AD Security Groups
- TEM System Administrators only should have a Master Operator account



Master Operator Account Overhead

- When a Master Operator does anything that requires signing an action (types in password), a new version of the actionsite is created. All Master Operators share a single actionsite
- By definition, the new actionsite MUST be gathered by ALL computers in the deployment
- Multiple Master Operators creating new versions of the actionsite can cause each Client to gather large amounts of data
- Use Master Operator Roles to:
 - Assign management rights to Non-master Operators
 - Create Retrieved Properties
 - Manage site subscriptions
 - Deploy certain policy actions
 - Create Custom Content that can be seen by all Operators and will likely be used on most machines



Non-master Operator Account Overhead

- When a Non-master Operator does anything that requires signing an action (types in password), a new opsite is created. The opsite is generally many times smaller than a Master Operator actionsite.
- The opsite contains ONLY material generated by the owner of the opsite
- By definition, the new opsite MUST be gathered ONLY by computers which have been assigned to the Non-master Operator
- Use Non-master Operator Roles to:
 - Deploy/Activate/Deactivate Fixlets, Tasks, Baselines, Analyses
 - Create Operator and Site-Specific Custom Content
 - HINT: Create a Non-Master Operator assigned to All Computers

Console Usage

- Use a master operator account for administrative type operations.
- Use a non-master operator account for day to day operations.
- Do not use the console over a slow link - 100 mbps or 1 gbps will give best performance.
- Use the BES Console when you need to take actions.
- Use Web Reports when you need to monitor results or generate reports.
- Close the BES Console when it is not in use.



Console Performance

- Use BES Console caching (File > Preferences) to have faster load times.
- Make sure you use a high-powered BES Console computer – in particular large amounts of memory will give better performance (2 GB RAM recommended).
- Turn down your BES Console refresh rate if you experience frequent console “pauses”.
- Open BES Console tree controls, searches and documents will be refreshed when the console is refreshed and this can lead to slower refresh performance.



Actions

- Use action presets when taking actions to avoid typos and mistakes.
- When targeting an action with more than 100 targets use property based targeting instead of list based targeting
- When taking policy actions use property based targeting
- Use automatic groups to organize your endpoints for easily repeatable action targeting with a minimum of management.
- Keep actions closed if they are no longer needed – This helps improve agent responsiveness.
- Delete actions that are no longer needed – This reduces console load time and memory.





Best Practices

TEM Server





TEM Server

- The TEM Server performs key communications activities:
 - Takes reports from Relays/Clients
 - Frequently Inserts/Updates database rows
 - Propagates actions
- Heavy use of TCP/IP (HTTP)
- TEM Server Best Practices focus on maximizing communications efficiencies without diminishing functionality



TEM Server Best Practices

- Manage the interaction of Virus Scanners with the TEM Server Folder Structure
 - At a minimum, exclude these structures from real-time scanning in favor of a scheduled scan :
 - [BigFix Server]\FillDBData\BufferDir
 - [BigFix Server]\sitearchive
 - [BigFix Server]\wwwrootbes\bfmirror\bfsites
 - [BigFix Server]\wwwrootbes\bfsites



TEM Server Best Practices

- Increase the cache size on the TEM Server to smooth the process of downloading files from the Internet
 - Default is 1GB,
 - setting "_BESGather_Download_CacheLimitMB"
 - Task #148 automates management of this setting
 - General recommendation is 10 GB



TEM Server Best Practices

- Disable the Windows Indexing Service on the TEM Server file structure
 - Prevents indexing of the many temporary files that are created during normal BigFix Server operation
- Do not use Windows file compression on the TEM Server file structure.
 - Consistent with Microsoft KB251186 - Best Practices for NTFS Compression in Windows



TEM Server Best Practices

- Database I/O management has a positive effect on TEM's overall performance
 - Set SQL Server transaction logging to 'simple'
 - Mount the database on an array separate from the database log and transaction log, all arrays should be RAID 10 on separate controllers



TEM Server Best Practices

- Adjust the TEM Client Heartbeat to reduce communications traffic on the TEM Server
 - < 10,000 seats – 20 minutes
 - < 25,000 seats – 45 minutes
 - < 50,000 seats – 60 minutes
 - < 100,000 seats – 90 minutes
 - < 150,000 seats – 120 minutes



TEM Server Best Practices

- Three Additional Computer Settings can help reduce overall load on the TEM Server
 - `_BESRelay_HTTPServer_MaxConnections`
 - `_BESClient_Report_MinimumInterval`
 - `_BESClient_Register_IntervalSeconds`
- Controlled through Client Settings on the TEM Server Machine



TEM Server Best Practices

- **_BESRelay_HTTPServer_MaxConnections**
Controls how many connections the TEM Root Server allows to be open
 - Set on TEM Server machine
 - be opened.
 - DEFAULT: 2048
 - CONSIDER: 4096



TEM Server Best Practices

- **__BESClient_Report_MinimumInterval**
 - The minimum amount of time in seconds between reports from a TEM Client. (Note: Clients may report status frequently when Actions are running)
 - Set on each BigFix Client
 - DEFAULT: 15 seconds
 - CONSIDER: 180 seconds



TEM Server Best Practices

- **_BESClient_Register_IntervalSeconds**
Controls how often a Client registers with the TEM Server to update IP address and get a new license number
 - Set on each TEM Client
 - DEFAULT: 21,600 (6 hours)
 - CONSIDER: 82,200 (23 hours)



Best Practices

Relays/Infrastructure





TEM Relays

- A Relay is created by installing a Relay package, consisting of a TEM Relay Service and associated folder structures, on server or desktop machines that are running the TEM Client.
- TEM Relays address two important issues:
 - Bandwidth and Utilization Constraints
 - Enterprise Scalability
- Two approaches to Relay assignment are available in TEM
 - Manual
 - Automatic



TEM Relay Selection

- **Manual Relay Selection (TEM Out of Box Default)**
 - A TEM administrator manually points a TEM client machine to a relay or relays (primary/secondary/failover). The default (out of the box) Primary/Secondary are the Main TEM Server
 - Every 6 hours, the TEM Client will attempt to confirm it's connection to the Primary relay. If the Primary fails, it looks to the Secondary relay, then to the Failover relay.
 - As a last resort, the TEM Client will try to connect to the TEM Server
- **Manual Relay Selection is recommended to point Relays to parent Relays or to the TEM Server.**



Relay Selection Controls

- **__RelaySelect_Automatic** value = [0 = Manual (default), 1 = Automatic]
- **__RelayServer1** value = [http://<RELAYNAME1>:<port>/bfmirror/downloads/"]. The setting is used only if __RelaySelect_Automatic = 0. RELAYNAME1 defaults to the Main BES Server.
- **__RelayServer2** value = [http://<RELAYNAME2>:<port>/bfmirror/downloads/"]. The setting is used only if __RelaySelect_Automatic = 0. RELAYNAME2 defaults to the Main BES Server.



Console Panel Relay Controls

Edit Computer Settings [X]

Settings | Target | Message | Constraints

Change the following settings:

- Locking Status
 - Locked
 - Unlocked
- BES Relay Selection Method
 - Automatically Locate Best BES Relay
 - Set BES Relays Manually
- Primary BES Relay
 - Main BES Server
- Secondary BES Relay
 - Main BES Server
- Custom Setting
 - Name:
 - Value:
- Custom Site Membership
 - Subscribe to site:
 - Unsubscribe from site:

OK Cancel



TEM Relay Selection

- Automatic Relay Selection
 - A TEM administrator must change the Relay Selection method from Manual to Automatic for each machine where Automatic Relay selection is desired
 - Significant advantages include:
 - Automatic load balancing across the enterprise
 - Each machine finds it's optimal relay
 - Dynamic reconfiguration as the network changes
 - Roaming machines always find closest relay



TEM Relay Selection

- Automatic Relay Selection – Default Behavior
 - Every 6 hours, the TEM Client will attempt to connect to the closest relay (measured in network hops) on the list of valid relays in the actionsite (relays.dat). If it succeeds, no further activity takes place
 - If it does not succeed, it begins a process of sending out ICMP pings, in a range from 1 to 255, attempting to get a response from one of the relays on the list. When it gets a response, it tries to connect. If it succeeds, the process ends; if it fails to connect, the process continues.
 - If the Client fails to connect to a relay, it will try to connect to the TEM Server



Observations ♦ Relays/Infrastructure

- Relays and network connections are the part of the TEM infrastructure where TEM Administrators often have the least amount of direct control
- Changes to this part of the TEM infrastructure have widely visible impacts, whether positive or negative
- Best Practices in this area must be intelligent, flexible, and wide ranging
- The key to managing Relays/Infrastructure is to manage the Relay Autoselection Process (ICMP)



Understanding Relay Topology

- **Number of computers running TEM**
 - Small: <5000
 - Medium: 5,000-20,000
 - Large: 20,000-50,000
 - Very Large: 50,000+

- **Relay Distribution (assumes 1 relay per 1,000 TEM Clients and/or 1 relay for each LAN)**
 - Centralized: <50 Relays
 - Slightly Distributed: 50-200 Relays
 - Moderately Distributed: 200-1,000 Relays
 - Highly Distributed: 1,000 or more Relays



Managing Automatic Relay Selection

- Five Relay Management Settings
 - **_BESClient_RelaySelect_MaximumTTLToPing**
 - **_BESClient_RelaySelect_IntervalSeconds**
 - **_BESClient_RelaySelect_ResistFailureIntervalSeconds**
 - **_BESClient_RelaySelect_MinRetryIntervalSeconds**
 - **_BESClient_RelaySelect_MaxRetryIntervalSeconds**
- Use Policies to manage these settings for all TEM Clients that are not Relays



Managing Automatic Relay Selection

- **`_BESClient_RelaySelect_MaximumTTLToPing`** – the maximum TTL to use in automatic Relay selection
 - *Default: 255 (Hops)*
 - Tradeoffs:**
 - A higher TTL value will allow the TEM Client to find TEM Relays that are farther away.
 - Higher MaxTTL values will generate more ICMP traffic during automatic Relay selection
 - A smaller TTL will generate fewer ICMP packets but TEM Clients will only be able to find TEM Relays that are closer in terms of network hops.
 - If a TEM Client is unable to find a Relay at a distance less than the MaxTTL, it will attempt to select its failover Relay, if one has been specified (**`_BESClient_RelaySelect_FailoverRelay`** setting).



Managing Automatic Relay Selection

_BESClient_RelaySelect_MaximumTTLToPing Recommendations (Setting in Hops)				
	Small	Medium	Large	Very Large
Centralized	30	20	20	10
Slightly Distributed	20	10	10	8
Moderately Distributed	8	6	5	5
Highly Distributed	6	4	4	4



Managing Automatic Relay Selection

- **__BESClient_RelaySelect_IntervalSeconds**
TEM Relay selection algorithm will run periodically as specified by this setting.
 - *Default: 21600 (Seconds)*

Tradeoffs:

- A smaller Relay selection interval will allow TEM Clients to find closer TEM Relays more frequently.
- Large values minimize the number of ICMP packets in aggregate, but smaller values allow for faster times to optimal Relay selection.





Managing Automatic Relay Selection

_BESClient_RelaySelect_IntervalSeconds Recommendations (Setting Value in Seconds)				
	Small	Medium	Large	Very Large
Centralized	21,600 (6 hours)	21,600 (6 hours)	86,400 (1 day)	86,400 (1 day)
Slightly Distributed	21,600 (6 hours)	43,200 (12 hours)	86,400 (1 day)	129,600 (1.5 days)
Moderately Distributed	43,200 (12 hours)	86,400 (1 day)	259,200 (3 days)	259,200 (3 days)
Highly Distributed	86,400 (1 day)	259,200 (3 days)	604,800 (7 days)	604,800 (7 days)



Managing Automatic Relay Selection

- **_BESClient_RelaySelect_ResistFailureIntervalSeconds**
amount of time TEM Clients will wait after its Relay appears down before performing TEM Relay selection
 - *Default: 600 (Seconds)*

Tradeoffs:

- A lower failure interval will allow TEM Clients to quickly find alternative TEM Relays in the event that a TEM Relay is not available.
- A lower failure interval creates higher connectivity rate when TEM Relays are uninstalled or having communication failures.
- A higher value will allow more resilience if the TEM Relays or TEM Server is unavailable.



Managing Automatic Relay Selection

_BESClient_RelaySelect_ResistFailureIntervalSeconds Recommendations (Setting Value in Seconds)				
	Small	Medium	Large	Very Large
Centralized	600 (10 minutes)	1,800 (30 minutes)	3,600 (1 hour)	3,600 (1 hour)
Slightly Distributed	1,200 (20 minutes)	3,600 (1 hour)	3,600 (1 hour)	7,200 (2 hours)
Moderately Distributed	3,600 (1 hour)	7,200 (2 hours)	21,600 (6 hours)	21,600 (6 hours)
Highly Distributed	7,200 (2 hours)	14,400 (4 hours)	21,600 (6 hours)	21,600 (6 hours)



Managing Automatic Relay Selection

- **`_BESClient_RelaySelect_MinRetryIntervalSeconds`**
If the automatic Relay selection fails (no TEM Relays were found), the TEM Client will try again after this many seconds. The TEM Client will double this value on each successive retry that fails to locate a TEM Relay.
 - *Default: 60 (Seconds)*

Tradeoffs:

- A lower Minimum Retry Interval will allow the TEM Client to run Relay selection more often and find TEM Relays faster after a failure.
- A higher value will generate fewer ICMP packets but make failure recovery slower.



Managing Automatic Relay Selection

_BESClient_RelaySelect_MinRetryIntervalSeconds Recommendations (Setting Value in Seconds)				
	Small	Medium	Large	Very Large
Centralized	600 (10 minutes)	1,800 (30 minutes)	3,600 (1 hour)	3,600 (1 hour)
Slightly Distributed	1,200 (20 minutes)	3,600 (1 hour)	3,600 (1 hour)	7,200 (2 hours)
Moderately Distributed	3,600 (1 hour)	7,200 (2 hours)	21,600 (6 hours)	21,600 (6 hours)
Highly Distributed	7,200 (2 hours)	14,400 (4 hours)	21,600 (6 hours)	21,600 (6 hours)



Managing Automatic Relay Selection

- **_BESClient_RelaySelect_MaxRetryIntervalSeconds**

After failing to find a TEM Relay, the TEM Client will continue to try to find a TEM Relay. Each time it fails, the TEM Client will double the time it spends until this maximum is exceeded. Then the TEM Client will try with this maximum retry interval until it successfully selects a TEM Relay.

- *Default: 7200 (Seconds)*

Tradeoffs:

- A lower Maximum Retry Interval will allow TEM Clients to recover from down times faster, but will create relatively more ICMP traffic
- A higher value will force a longer recovery time but create relatively less ICMP traffic





Managing Automatic Relay Selection

_BESClient_RelaySelect_MaxRetryIntervalSeconds Recommendations (Setting Value in Seconds)				
	Small	Medium	Large	Very Large
Centralized	7,200 (2 hours)	14,400 (4 hours)	28,800 (8 hours)	28,800 (8 hours)
Slightly Distributed	7,200 (2 hours)	14,400 (4 hours)	57,600 (16 hours)	86,400 (1 day)
Moderately Distributed	14,400 (4 hours)	86,400 (1 day)	129,600 (1.5 days)	129,600 (1.5 days)
Highly Distributed	28,800 (8 hours)	129,600 (1.5 days)	172,800 (2 days)	172,800 (2 days)



Relay Affiliation

- Creates groups for automatic selection to select relays from
- Compartmentalizes selection order, reducing network traffic
- Allows fine control to match clients to potential relays without selecting the entire relay list
- Creates another layer of automatic selection
 - Relay affiliation groups first, in a predictable order
 - All relays (if desired, using the special group: *)
 - Failover relay
 - Root server



Relay Affiliation – Settings

- **_BESRelay_Register_Affiliation_AdvertisementList**
 - Semicolon delimited list
 - Tells clients which relays belong to which group
 - Must include * as a group in order for the relay to be selectable by clients without a matching seeklist value.
 - * marks the relay as “unaffiliated”
 - **Sample value: NorthAmerica;Asia;***
 - Can only be selected by clients that have NorthAmerica, Asia, *, or no seeklist at all.



Relay Affiliation – Settings

- **_BESRelay_Register_Affiliation_SeekList**
 - Semicolon delimited list
 - Runs full selection cycle on each group in order, left to right
 - If a relay is found in the first group, further groups are not evaluated
 - If * is not present in the list, the client will not attempt to select relays with no advertisement list.
 - Further detail at:
<https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/Tivoli%20Endpoint%20Manager/page/Relay%20Affiliation>



Resources

■ Former BigFix

Community

- <http://forum.bigfix.com>

Support

- <http://support.bigfix.com>

■ New IBM

Community

- <https://www.ibm.com/developerworks/servicemanagement/em/index.html>

Wiki

- <https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/Tivoli%20Endpoint%20Manager/page/Home>

Support

- <http://www.ibm.com/planetwide/us/>