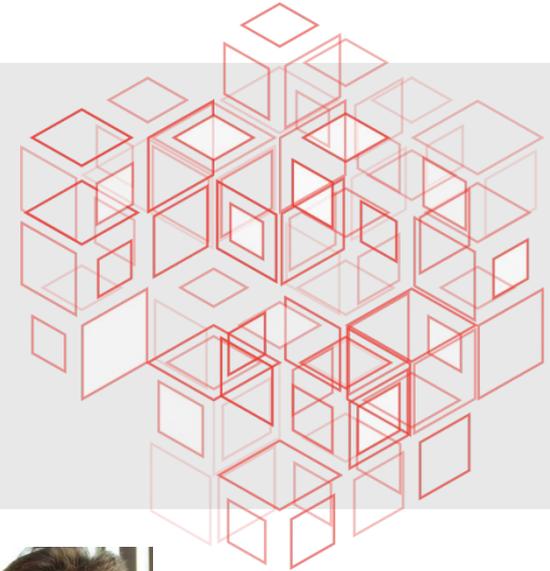


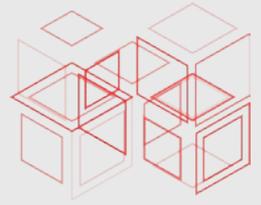
# ILMT Skills for the IT Support Staff

27 October 2016



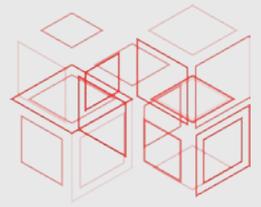
**Mark S. Feinman**  
Senior Solution Architect  
Siwel Consulting, Inc.

# Agenda



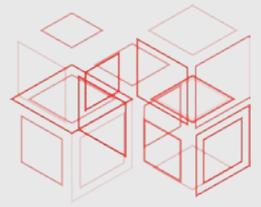
- 1 What is the IBM License Metric Tool (ILMT)?
- 2 How Do The Various Technologies of ILMT Fit Together?
- 3 A Look at the Individual Components of ILMT
- 4 Skills Necessary to Support ILMT
- 5 Where To Look When Trouble Occurs
- 6 Summary

# The IBM License Metric Tool Defined



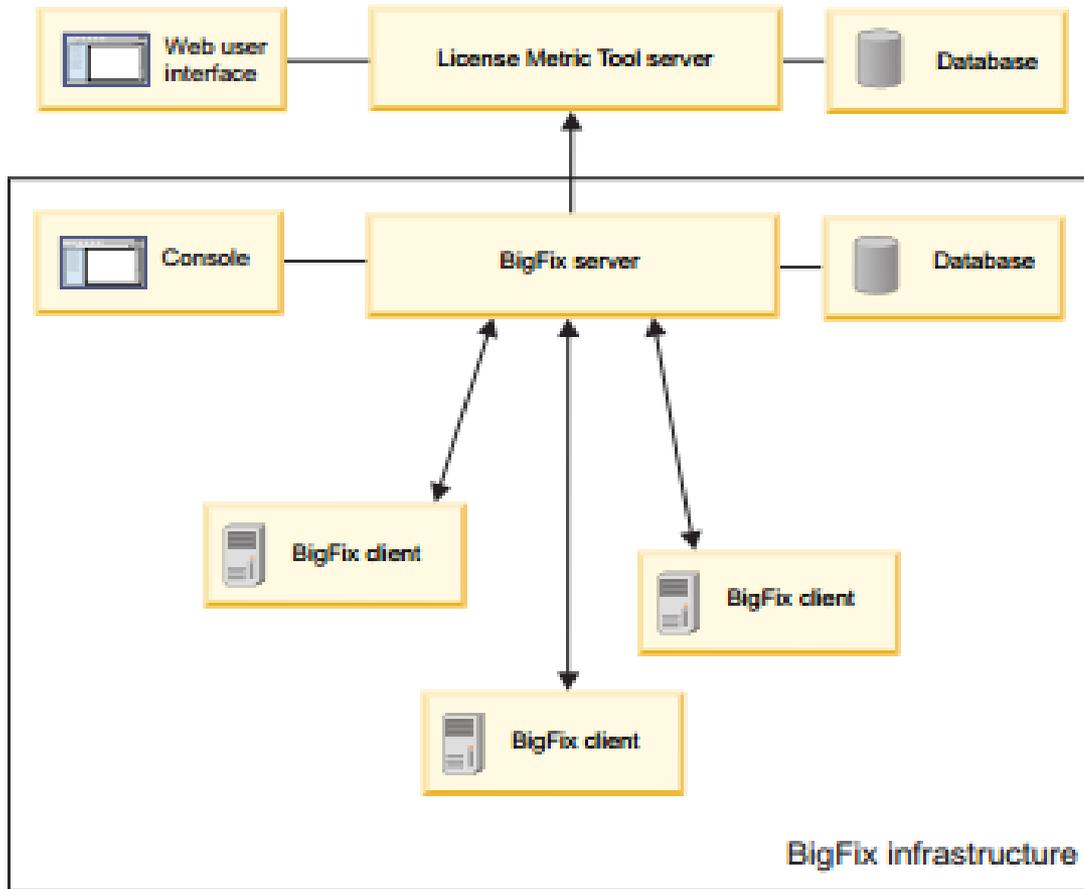
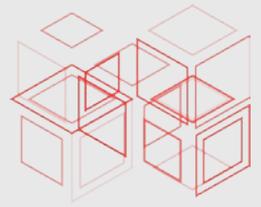
- ❑ IBM License Metric Tool (ILMT) helps IBM Passport Advantage customers determine their full and sub-capacity processor value units (PVU) licensing requirements. It helps calculate the number of PVUs available to installed Passport Advantage PVU-based software, including supported virtualized servers.
- ❑ A group of servers running various IBM products that are architected together in a specific manner to determine license consumption for IBM products found across your enterprise.
- ❑ BigFix Inventory is a superset of ILMT:
  - ILMT is ONLY IBM Software
  - BigFix Inventory (BFI) can be used with other vendors and includes all functionality that ILMT contains.

# The IBM License Metric Tool Consists of ...



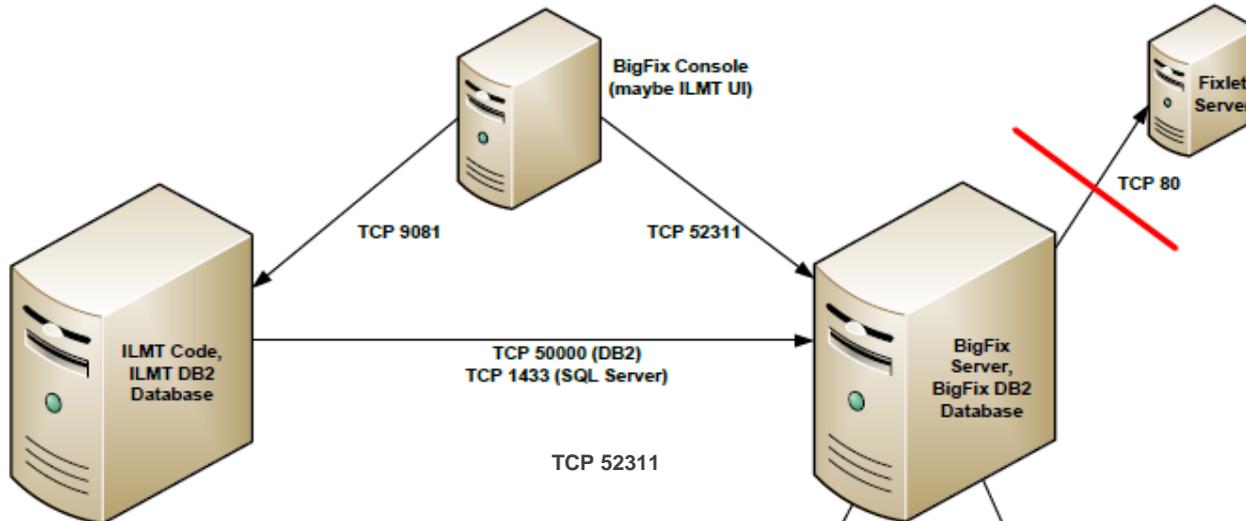
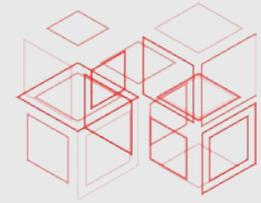
- ❑ The IBM Products:
  - BigFix Server
  - DB2 (if ILMT is deployed on Linux)
  - ILMT Server code
  - BigFix clients on all the computers you want scanned and reported on in ILMT
  
- ❑ Non-IBM Products:
  - Microsoft SQL Server (if ILMT is deployed on Windows)
  
- ❑ TCP/IP Connections between the products, and in the case of a BigFix client's immediate parent, a UDP connection

# How Do BigFix & ILMT Fit Together?



- ❑ Clients run scans through BigFix.
- ❑ Scan data is passed to BigFix database via scheduled tasks.
- ❑ ILMT performs a periodic extract, transfer and load (ETL) process known as the “Data Import”
- ❑ The import pulls data from BigFix into ILMT and performs license usage calculations.
- ❑ ILMT data is accessed through a Web-based UI.

# How Do BigFix & ILMT Fit Together?



**Advanced Masthead Parameters**

The default values for these parameters should be suitable for most IBM BigFix deployments. For further information about the implications of these parameters, please contact a IBM BigFix support technician.

Server Port Number:

Gathering Interval:

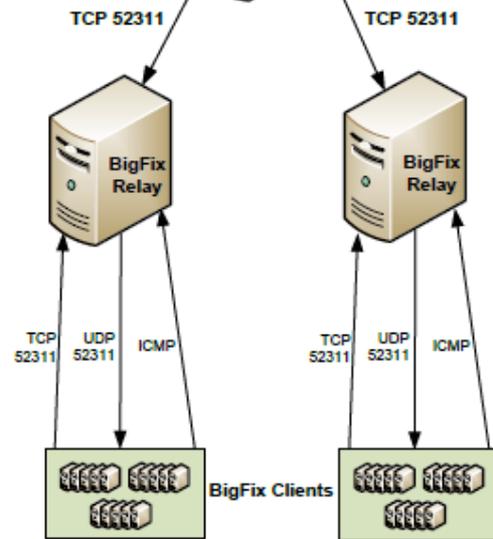
Initial Action Lock:   minutes

Action Lock Controller:

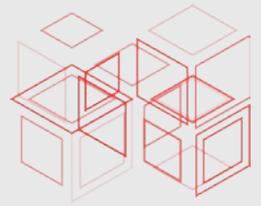
Exempt the following site URL from action locking:

Require use of FIPS 140-2 compliant cryptography.

Allow use of Unicode filenames in archives.



# Configuring Connections in ILMT (SQL Server)



Name\*

Data Source

Database for the IBM BigFix Server\*

Database Type\*

SQL Server

Host\*

iem92

Database Name\*

BFEnterprise

Authentication

- Windows Authentication  
 SQL Server Authentication

User Name\*

ilmt

Password

••••••••

IBM BigFix Server\*

Authentication (Console Operator)

User Name\*

IEMAdmin

Password\*

••••••••

Disable automatic address lookup

Web Reports Database

Database Type\*

SQL Server

Host\*

iem92

Database Name\*

BESReporting

Authentication

- Windows Authentication  
 SQL Server Authentication

User Name\*

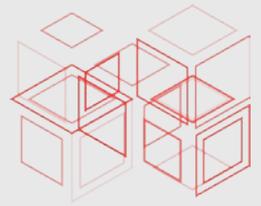
ilmt

Password

••••••••

From Management / Data Sources in the ILMT Web UI

# Configuring Connections in ILMT (DB2)



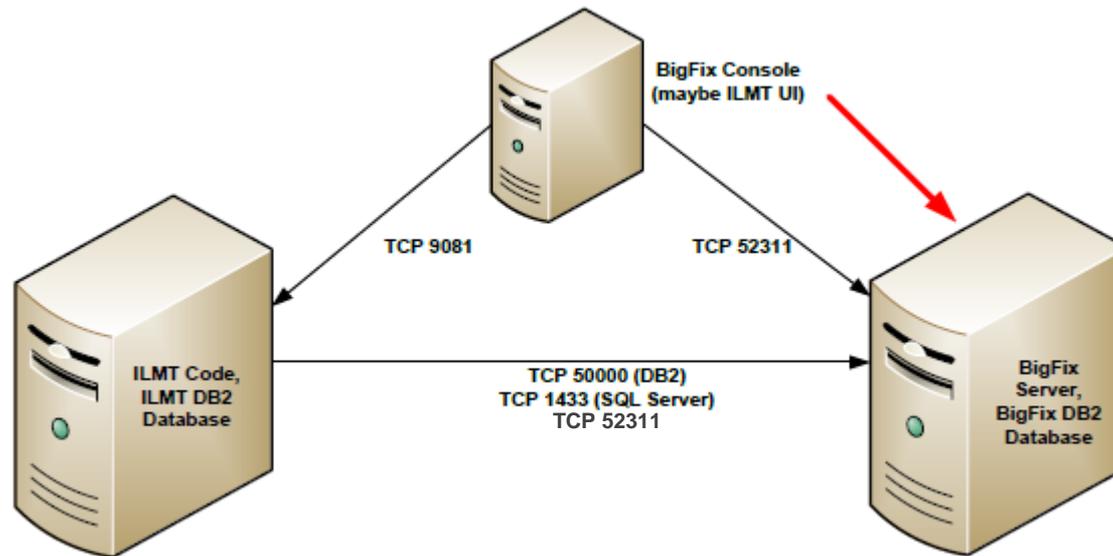
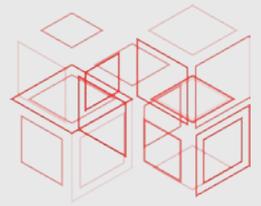
Name\*  
IEM Connection

---

<b>Database for the IBM BigFix Server*</b>	<b>IBM BigFix Server*</b>	<b>Web Reports Database</b>
Database Type* DB2	Authentication (Console Operator)	Database Type* DB2
Host* iem92linuxmark.siwel	User Name* IEMAdmin	Host* iem92linuxmark.siwel
Port* 50000	Password* ●●●●●●	Port* 50000
Database Name* BFENT	<input type="checkbox"/> Disable automatic address lookup	Database Name* BESREPOR
Authentication		Authentication
User Name* db2inst1		User Name* db2inst1
Password* ●●●●●●		Password* ●●●●●●

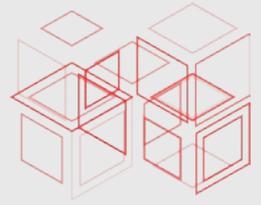
From Management / Data Sources in the ILMT Web UI

# The BigFix Server

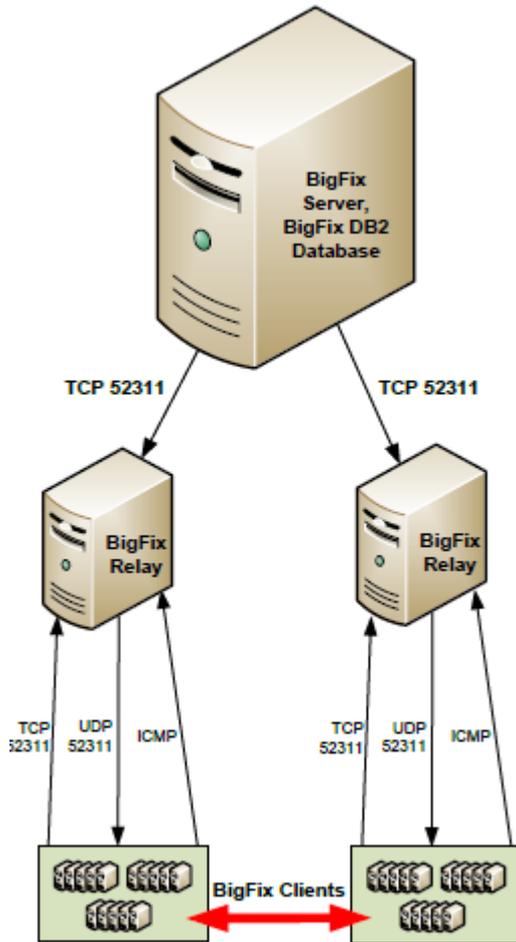


- ❑ BigFix Server: Managed using the BigFix Console
  - Installation of ILMT scanners
  - Setup and maintenance of software & capacity (hardware) scans
  - Collection of scan data
  - Verification of scan results (last scan occurrence, results of software scans)
  - Running the VM Manager Tool (to communicate with VMware)
  - Install ILMT upgrades (as a fixlet)
  - Upgrade scanners and the VM Manager Tool
  - Install BigFix upgrades via fixlet (except 9.2.3+ to 9.5.0)

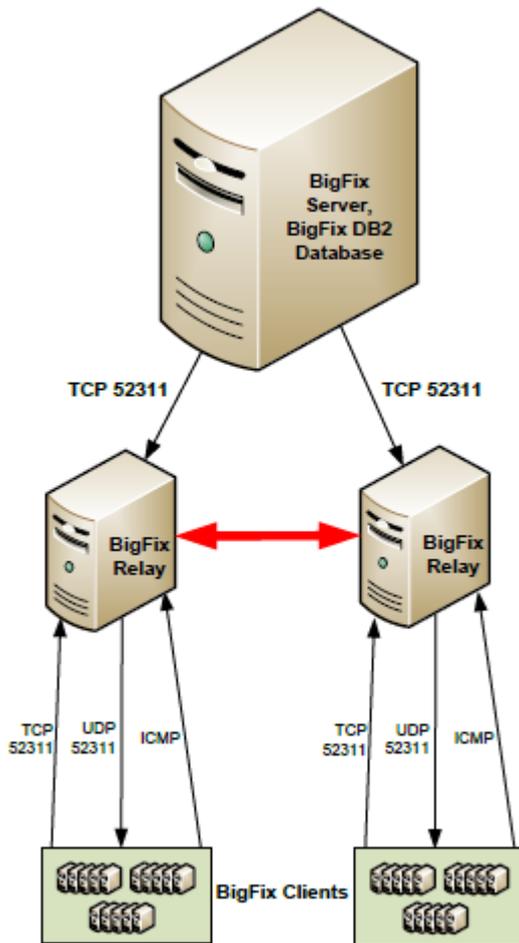
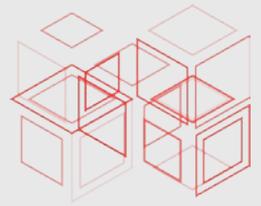
# The BigFix Client



- ❑ Any computer that you want ILMT to include as part of its license analysis must be scanned
- ❑ The BigFix Client receives a UDP signal (over default port 52311) that it may have something to do
- ❑ The BigFix Client evaluates whether the task to be done is relevant to this computer (should the task be run on this computer)
- ❑ If relevant, task is performed
- ❑ Tasks & Fixlets
  - Tasks such as the software scan and capacity scan are run at scheduled intervals
  - Fixlets such as scan upgrades are run only when necessary (the client determines that something wasn't necessary before, but it is now)

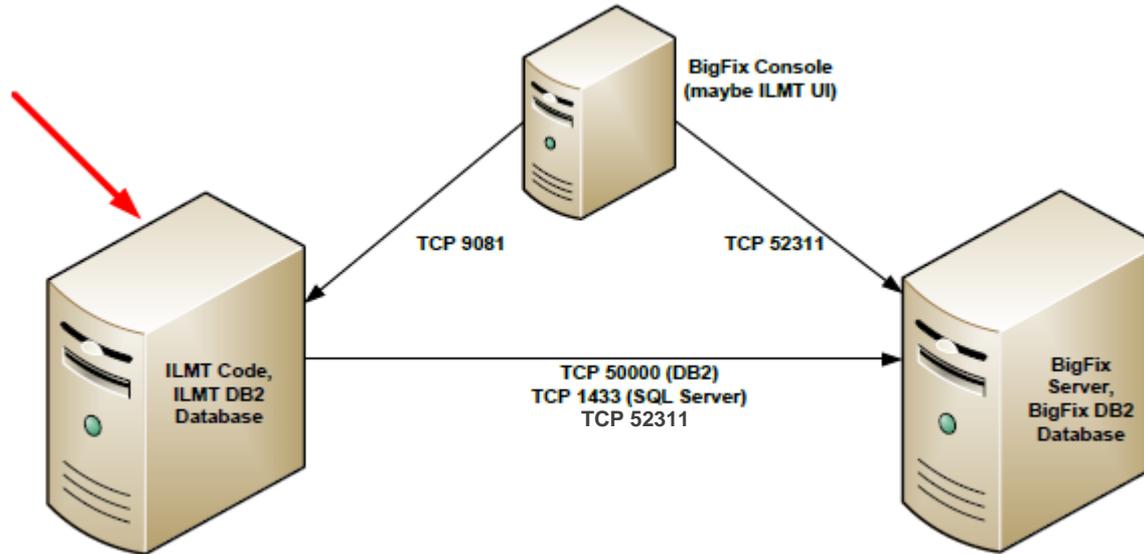
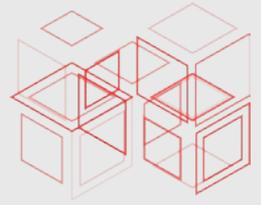


# The BigFix Relay



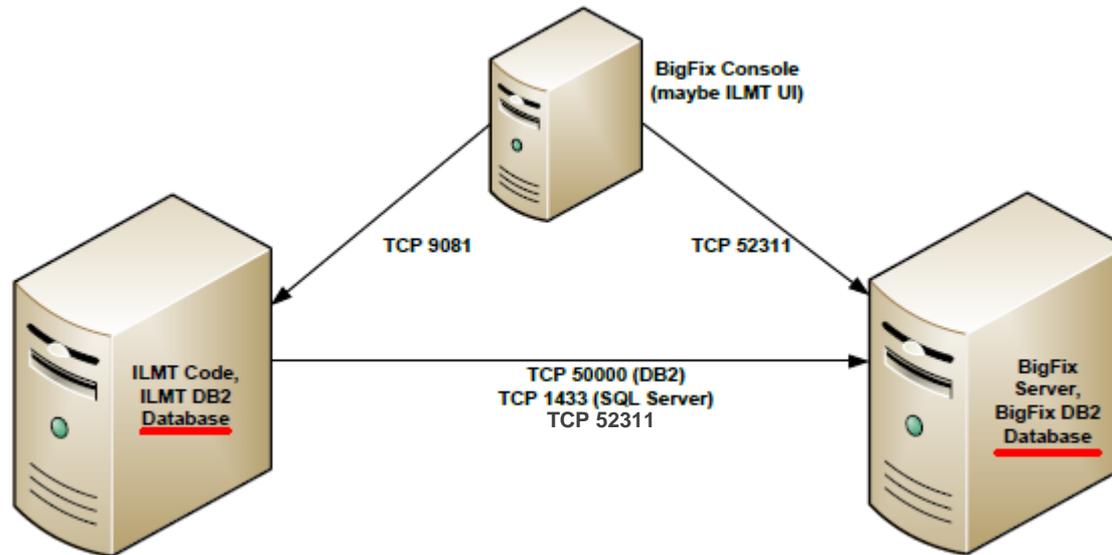
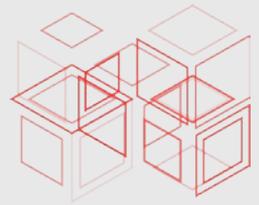
- ❑ One or more computers between the BigFix server and the BigFix client that are used to scale the infrastructure up to tens or thousands of computers
- ❑ One typical use is for connections through firewalls
- ❑ Another typical use is when clients are geographically disbursed or there are simply a large number of clients
- ❑ Relays "relay" information to and from the BigFix Client and another Relay or the BigFix Server.
- ❑ Relays enable BigFix Clients to gather the latest information about new Fixlet messages, new actions, or new downloads.
- ❑ Relays enable BigFix Clients to pass status messages to the BigFix Server such as action results and retrieved properties.

# The ILMT Server



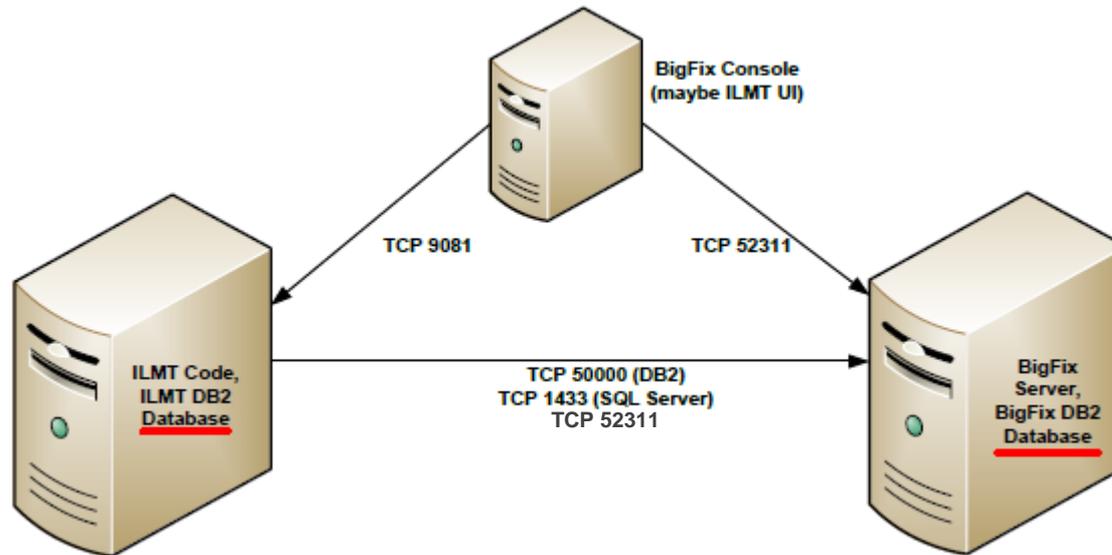
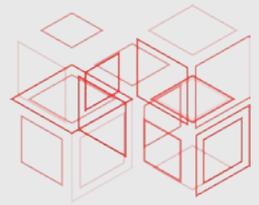
- ❑ Licensing calculations and some configuration is managed using the ILMT Web UI:
  - Data Import
  - VM Managers
  - Software Catalog Updates
  - PVU Table Updates
  - Part number uploads
  - Connectivity to BigFix databases
  - Your SAM Team uses the ILMT UI to perform product bundling
- ❑ Scan deployment, configuration and scheduling is done through the BigFix console

# The Relational Database



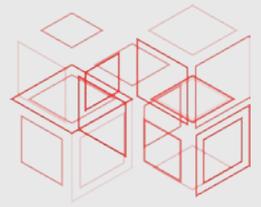
- ❑ BigFix has its own databases:
  - BFENT (DB2) / BFEnterprise (SQL Server): Collection of all scanned data and BigFix server settings
  - BESREPOR (DB2) or BESReporting (SQL Server): Web Reports component of BigFix; VM Manager Tool uses this.
- ❑ ILMT has its own database:
  - TEMADB (both DB2 and SQL Server): The ILMT database of computer license reconciliation

# The Relational Database



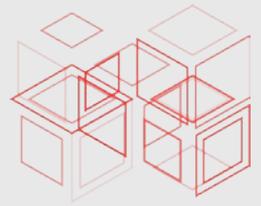
- ❑ ILMT pulls data from BigFix into its own database using the “Data Import”
- ❑ The “Data Import” is an ETL (extract, transform and load) process:
  - Scan data is extracted from the BigFix database
  - Software catalog is updated (if recently uploaded)
  - PVU table is updated (if recently uploaded)
  - Part number list of products you purchased is uploaded (when provided)
  - This data is then combined with scan data and previous bundling decisions to compute license usage and possibly reassign bundling decisions that your SAM team has not confirmed
  - Computations are stored in the ILMT TEMADB database; the SAM team accesses these results through report generation in the ILMT UI.
  - I/T support must ensure that the data import completes successfully.

# The ILMT UI

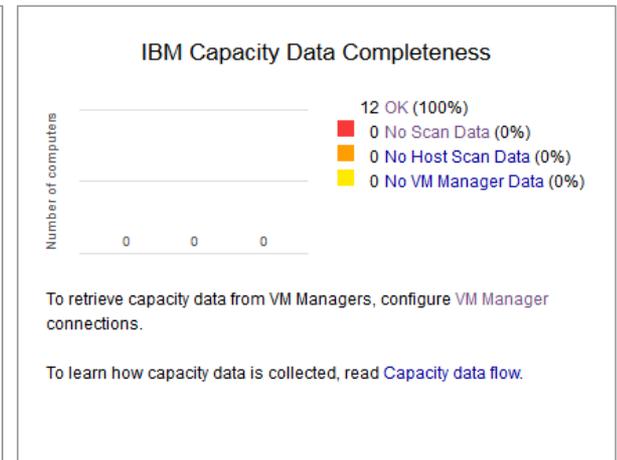
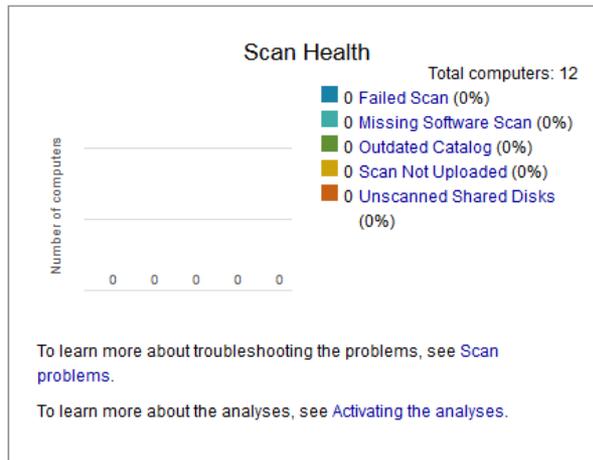
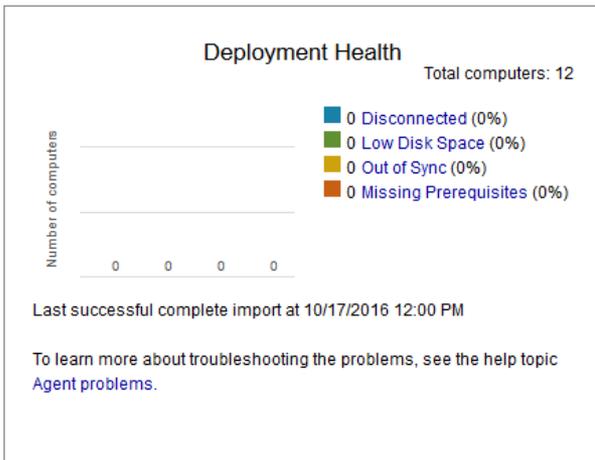


- ❑ Used by your SAM team to
  - Confirm product assignments
  - Reassign software components to products
  - Exclude (or include) products from pricing calculations
  - Reporting
    - Computer lists
    - Software lists
    - Software Inventory
    - Audit Report
  - Upload part numbers of products that were purchased
  
- ❑ The SAM team ordinarily doesn't use the BigFix console for anything

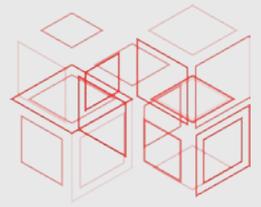
# The ILMT UI



- ❑ I/T uses it to
  - Examine the home page widgets for computers that have issues
  - Configure VM Managers and test connections
  - Modify connectivity parameters to BigFix
  - Set up users and their roles

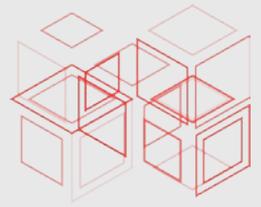


# Skills



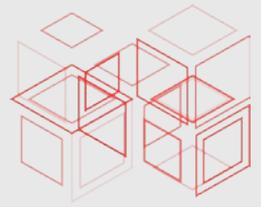
- ❑ So now that we know a bit about ILMT, what *\*ARE\** the skills necessary to support it?
- ❑ Skills:
  - TCP/IP networking
  - Relational Database
  - OS level skills: Windows and/or Linux
  - BigFix
  - ILMT product specific things
  - Forensics

# TCP/IP



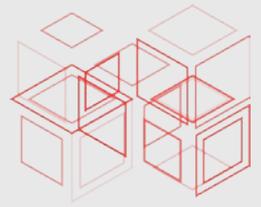
- ❑ Unless your deployment is very small (up to 5,000 clients being monitored), you're likely going to have one server for the ILMT server code and database, and one server for BigFix and its databases.
- ❑ You need to configure ILMT to connect to BigFix so it can perform its extract, transfer and load (the ILMT "Import").
- ❑ Clients being deployed have to talk to the BigFix server you set up.
- ❑ You may have BigFix clients that need to connect to the BigFix server through firewalls.
- ❑ You probably have to set up BigFix relays to help with network traffic and firewall crossings.
- ❑ Your lucky number will become 52311.
- ❑ ping, netstat, tracert and telnet utilities will become your friends.
- ❑ "port" doesn't mean "left" or "safe haven"

# Relational Database



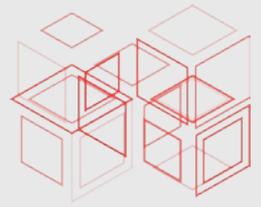
- ❑ DB2 or SQL Server
- ❑ You don't have to be a database administrator (DBA), but it sure helps if you have some DBA skills.
- ❑ Issues that occur usually pertain to the transaction log
  - Oh wait, you do know what the transaction log is, right?
  - Enables transactions to be played back in the event of a server failure
  - <http://www.ibm.com/developerworks/data/library/techarticle/0301kline/0301kline.html>
- ❑ Don't let the transaction log run out of space!
  - Logs in SQL Server are set to grow automatically as needed, but you still have to monitor for available disk space
  - Create one or two large files on the file system that can be immediately deleted when the disk fills up, allowing for breathing room while you allocate more space
  - DB2 transaction log is usually a set size that can't be exceeded

# Relational Database



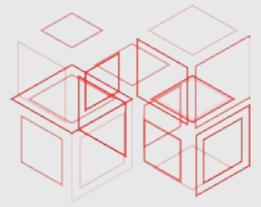
- ❑ For some ILMT upgrades that use DB2, you will need to increase the size of the transaction log.
- ❑ Common upgrade scenario with DB2 for existing deployments:
  - ILMT usually ships with DB2 10.5.0.3
  - To apply upgrades, you have to upgrade DB2 to fixpack 5 or higher
  - DB2 is not an easy database to stop, and under Linux, it has to be completely stopped, including the fault monitor.
  - If you don't stop the fault monitor, the Linux DB2 upgrade appears to start properly (and even says that it stopped the fault monitor) but fails miserably about a third of the way into the upgrade because even the upgrade can't stop the fault monitor!

# Relational Database



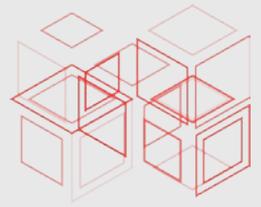
- ❑ DB2 fault monitor:
  - Stopping DB2, including the fault monitor:  
[https://www.ibm.com/support/knowledgecenter/SSEPGG\\_10.5.0/com.ibm.db2.luw.qb.server.doc/doc/t0024969.html](https://www.ibm.com/support/knowledgecenter/SSEPGG_10.5.0/com.ibm.db2.luw.qb.server.doc/doc/t0024969.html)
  - Starting the DB2 fault monitor: <http://www-01.ibm.com/support/docview.wss?uid=swg21209001>
- ❑ Query writing (or at least, understanding)
  - You may be supplied SQL to run in an ad-hoc manner by IBM support to help resolve open Service Requests (SRs)
- ❑ Database permissions could come into play if you use database userids that are different from the defaults
- ❑ “IBM Redbook “Up and Running With DB2 on Linux”  
(<http://www.redbooks.ibm.com/redbooks/pdfs/sg246899.pdf>)

# OS Level Skills



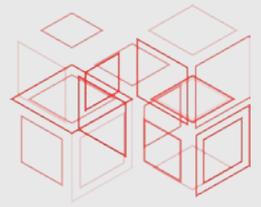
- ❑ More familiarity with Windows than Linux
- ❑ If you're familiar with the Windows command prompt, you're really half way there with Linux.
- ❑ The Linux installation process for both BigFix & ILMT is not that cumbersome.
- ❑ Practice installing Linux on a VM or two.
  - If you want to practice with Linux commands, have a look at this Linux emulator that runs right in your browser: <http://bellard.org/jslinux/index.html>.
  - DOS vs Linux command comparison: [http://www.yolinux.com/TUTORIALS/unix\\_for\\_dos\\_users.html](http://www.yolinux.com/TUTORIALS/unix_for_dos_users.html)
  - "[CompTIA Linux+ Study Guide](#)" by Christine Bresnahan and Richard Blum
- ❑ Use commands to check for available space, unzip files, change directories, look at logs
- ❑ Most used command: `tail -f <log file name>` - makes a log file "alive" like a console so you can see things happen as they occur.
- ❑ Tail is also available for Windows.

# BigFix



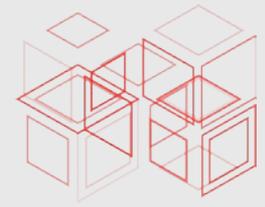
- ❑ Where all the connectivity is between clients & server.
- ❑ You need to be comfortable with all sorts of new concepts:
  - Relays
  - Masthead file
  - The concept of “relevance”
  - Sites
  - Tasks & fixlets
  - Actions
  - Analyses
- ❑ It helps to be able to read relevance language
  - Client relevance vs. session (loosely, server) relevance
- ❑ Must be comfortable using the BigFix console
  - “taking action” to schedule ILMT hardware and software scans
  - using analyses to verify results
  - “show action info” to see the results of an action

# BigFix



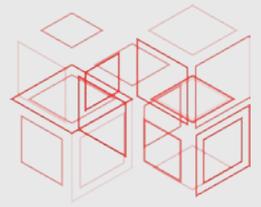
- ❑ If you're designing a new deployment of ILMT, nearly all of the design will focus on the BigFix architecture:
  - How many clients?
  - Where are the clients?
  - How many relays?
  - Clients in slow or remote networks?
  - Clients whose connection needs to cross a firewall?
  - Projected growth of clients?
  
- ❑ How to get up to speed (hope you like to read):
  - “RTFM” (read the “fine” manuals)
    - Install
    - Admin
    - Console guide
    - Wiki
  - BigFix videos! <http://www-01.ibm.com/support/docview.wss?uid=swg21616676>
  - BigFix forum: <https://forum.bigfix.com/>

# BigFix & ILMT joined at the hip



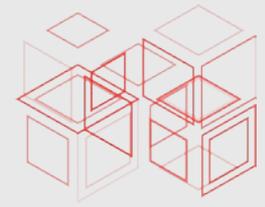
- ❑ ILMT “sits on top of” BigFix Infrastructure but in some cases is “right there” with BigFix
- ❑ Connection to VM Managers is created and the connection test is launched through the ILMT UI, but the actual use of the connection is the VM Manager Tool on the BigFix server
  - Test Connection fixlet
  - Configure VM Manager fixlet
- ❑ Loading an updated software catalog is performed through the ILMT UI and is deployed to all clients through the Data Import
  - Updates software catalog in ILMT database
  - Creates “Catalog Update” fixlet, which is dispatched to all clients
- ❑ ILMT Forum:  
<https://www.ibm.com/developerworks/community/forums/html/forum?id=111111-0000-0000-0000-000000002453>
- ❑ Works great when things go right, but what to do when things go wrong?

# Forensics!



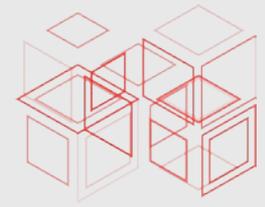
- ❑ Every aspect of an ILMT deployment has logs:
  - ILMT UI has logs
  - VM Manager Tool has logs
  - Data Import has logs
  - BigFix client has logs
  - BigFix server has logs
  - BigFix relay has logs
  - BigFix actions have logs! (“Show Action Info” in BigFix console)
  - DB2 has logs
  - SQL Server has logs
  
- ❑ BigFix also has analyses to aid in troubleshooting that record non-fatal errors, such as an action failing to run, or an ILMT software scan not completing
  
- ❑ Where do you get started?
  - Usually don't need to look at DB2 or SQL Server logs themselves unless there's some deep rooted issue with the database manager itself (highly unlikely)

# Forensics: Where To Look



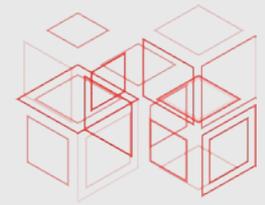
Generally speaking, look in this log ...	... when this type of issue occurs
BigFix client log	<ul style="list-style-type: none"><li>• Client can't connect to server</li><li>• Computer name does not appear in the BigFix console</li><li>• ILMT scan doesn't seem to run</li><li>• Client was sent an action to run, but it isn't running the action</li><li>• Client is "greyed out" in the BigFix console</li></ul>
ILMT (UI) log	<ul style="list-style-type: none"><li>• Something goes amiss with the ILMT web application</li><li>• The dreaded "sorry, something went wrong" message trying to log into ILMT</li></ul>
BigFix action log / Analyses	<ul style="list-style-type: none"><li>• A BigFix action doesn't complete successfully</li><li>• An ILMT scan doesn't complete or appears to always be running</li></ul>

# Forensics: Where To Look



Generally speaking, look in this log ...	... when this type of issue occurs
VM Manager Tool	<ul style="list-style-type: none"><li>• The ILMT UI home page, data completeness widget, has a high number of computers that report “No VM Manager Data”</li><li>• You made changes to a VM Manager in the ILMT UI and the connection test fails</li><li>• The VM Managers panel in the ILMT UI is reporting a connectivity issue with a VM Manager</li></ul>
Data Import Log	<ul style="list-style-type: none"><li>• Generally, this log should be checked daily to see if there ARE issues</li></ul>
BigFix server or relay log	<ul style="list-style-type: none"><li>• A BigFix action never gets to the client (and you verified this in the client’s BigFix client log)</li><li>• Actions appear slow to run</li></ul>

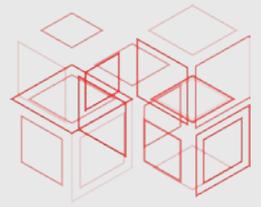
# Data Import Log Failure Example



## Import History

Status	Start Time	User Name	Duration	Download	
✓	10/11/2016 04:30 PM	ILMTAdmin	0:00:00	↓	capacity scan data were successfully imported. For 0 files the import failed.
✗	10/11/2016 04:48 PM	ILMTAdmin	0:00:00	↓	2016-10-11 19:32:15 (+0:00:00.007) INFO: ETL from ImportCapacity: Success
✗	10/11/2016 03:30 PM	Scheduled	0:01:51	↓	2016-10-11 19:32:15 (+0:00:00.001) INFO: ETL Validate Central VM Manager Tool Remote ID: Start
✗	10/11/2016 12:00 PM	Scheduled	0:00:58	↓	2016-10-11 19:32:15 (+0:00:00.150) ERROR: Unexpected response code 503 received from IBM BigFix server iem92linuxmark.siwel.com. Ensure the server and its Web Reports service are running.
✗	10/11/2016 08:00 AM	Scheduled	0:00:52	↓	2016-10-11 19:32:15 (+0:00:00.002) ERROR: An error occurred while sending a request to IBM BigFix server iem92linuxmark.siwel.com : Unexpected response code 503 received from IBM BigFix server iem92linuxmark.siwel.com. Ensure the server and its Web Reports service are running.
✗	10/10/2016 03:30 PM	Scheduled	0:01:08	↓	2016-10-11 19:32:15 (+0:00:00.001) INFO: ETL Validate Central VM Manager Tool Remote ID: Failed
✗	10/10/2016 12:00 PM	Scheduled	0:00:55	↓	2016-10-11 19:32:15 (+0:00:00.031) ERROR: Exception: An error occurred while sending a request to IBM BigFix server. Before you can configure VM managers, you must install and run the IBM BigFix services, including Web Reports. For more information, see the product documentation.
✗	10/10/2016 08:00 AM	Scheduled	0:00:52	↓	<pre> /opt/ibm/LMT/wlp/usr/servers/server1/apps/tema.war/WEB-INF/domains/sam/app/controllers/management/sam/vm_managers_controller.rb:334:in `get_root_computer_id' /opt/ibm/LMT/wlp/usr/servers/server1/apps/tema.war/WEB-INF/domains/sam/app/controllers/management/sam/vm_managers_controller.rb:485:in `validate_central_tool_remote_id' /opt/ibm/LMT/wlp/usr/servers/server1/apps/tema.war/WEB-INF/domains/sam/domain.rb:704:in `Domain' org/jruby/RubyProc.java:271:in `call' </pre>

# Where Are The Logs?



- ❑ BigFix client logs:

<https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Endpoint%20Manager/page/Common%20File%20Locations>

- ❑ BigFix server logs:

<https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Endpoint%20Manager/page/BigFix%20Logging%20Guide>

- ❑ ILMT Logs:

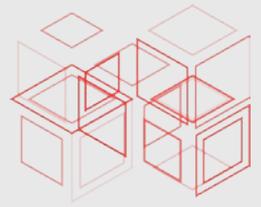
[https://www.ibm.com/developerworks/community/blogs/ilmt/entry/common\\_location\\_for\\_ilmt\\_sua\\_9\\_x\\_logs?lang=en](https://www.ibm.com/developerworks/community/blogs/ilmt/entry/common_location_for_ilmt_sua_9_x_logs?lang=en)

- ❑ VM Manager Tool logs: <http://lmt-tad4d.blogspot.com/2014/06/iem-client-logs-and-configuration-files.html>

- ❑ ILMT Forum:

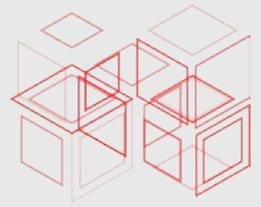
<https://www.ibm.com/developerworks/community/forums/html/forum?id=11111111-0000-0000-0000-000000002453>

# Wrap Up

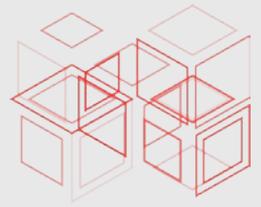


- ❑ BigFix is the “plumbing”.
  - ❑ ILMT “sits on top of” BigFix and uses the Data Import to extract, transform and load data to the ILMT database
  - ❑ SAM team uses ILMT UI to manage software usage and perform bundling.
  - ❑ I/T uses ILMT UI for some configuration, though most of it is done in the BigFix console.
  - ❑ We looked at how everything fits and drilled down a bit into the individual components
- ❑ Important Skills:
    - TCP/IP Networking
    - Relational Database
    - OS Level
    - BigFix
    - Forensics (where to look)
  - ❑ Links provided for further learning
  - ❑ List of logs and which ones to check
  - ❑ Forums are your friend
    - BigFix
    - ILMT

# About Siwel



- ❑ Founded in 1992, HQ in NYC
  - ❑ Service Fortune 50, Enterprise & mid-market companies
  - ❑ Top-tier provider of data-centric I/T solutions: hardware, software & services
  - ❑ Four core practice areas:
    - Data Storage & Computing
    - Data Analytics
    - Data Management
- IT Asset Management
- Software License Position and Compliance
  - Contract Advisory Services
  - Program Assessment and Design
  - Lifecycle Management Services
  - Tools Optimization Services
- Workforce Management Services
- Data Protection & Security



# Thank you!!

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