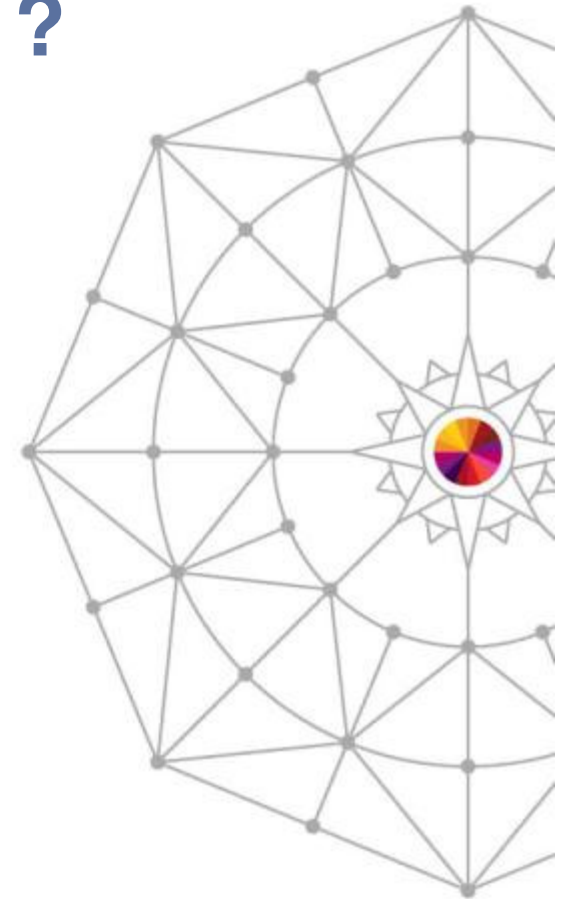# Need a Support Assistant ?
Check Out IBMs -   ISA

Michael Stephen

IBM

Thursday, March 13, 2014
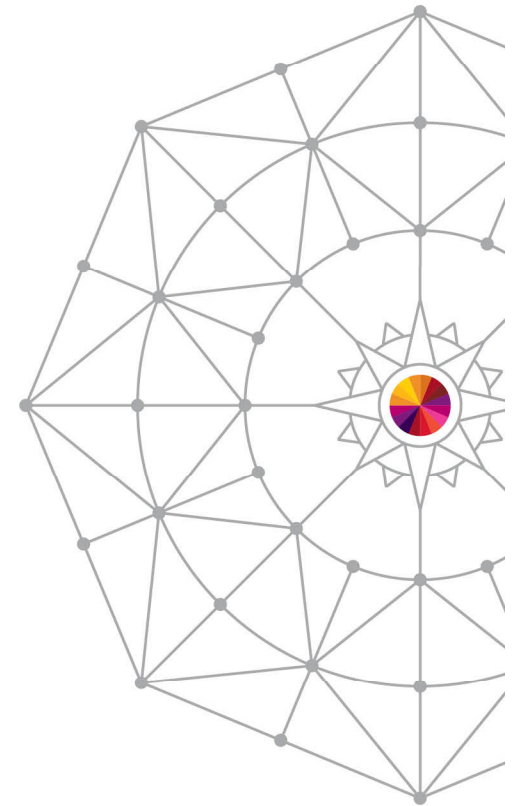Session # 14709

WebSphere Application Server on System Z
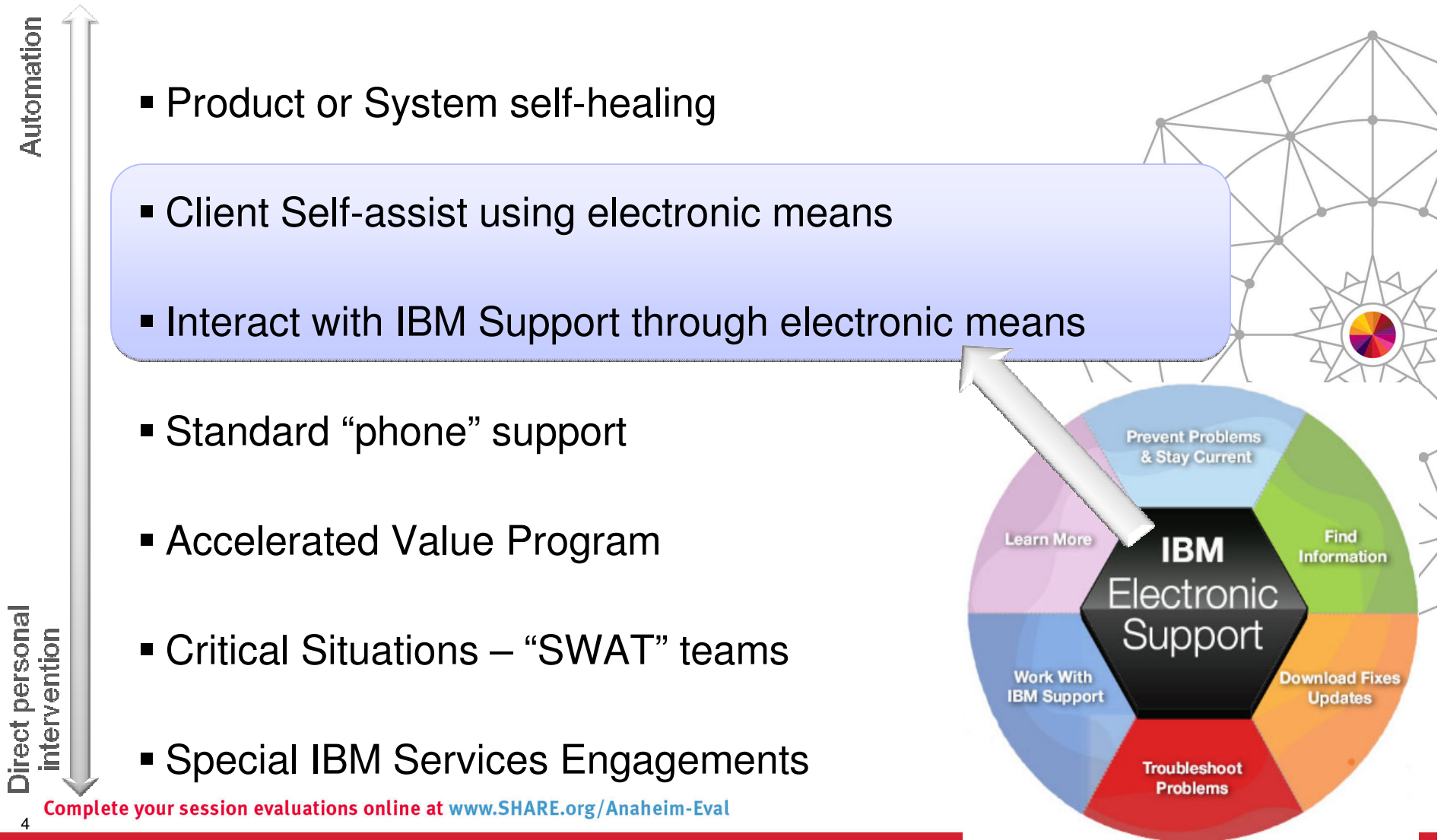
Session	Title	Time	Room	Speaker
14618	Getting Started with WebSphere Liberty Profile on z/OS	Monday 9:30	Grand Ballroom Salon C	Loos/Follis
14692	Getting Started with WebSphere Compute Grid	Tuesday 9:30	Grand Ballroom Salon J	Hutchinson/Loos
14693	Using WebSphere Application Server Optimized Local Adapters (WOLA) to Migrate Your COBOL to zAAP-able Java	Wednesday 9:30	Grand Ballroom Salon K	David Follis
14620	WebSphere Liberty Profile on Windows AND z/OS (among other things) Hands-on Lab	Wednesday 1:30	Platinum Ballroom Salon 7	
14949	Tips Learned Implementing Websphere Application Server (WAS) on Linux for IBM System z	Wednesday 3:00	Grand Ballroom Salon G	Eberhard Pasch
14709	Need a Support Assistant? Check Out IBM's! (ISA)	Thursday 8:00	Grand Ballroom Salon A	Mike Stephen
15050	z/OSMF 2.1 Implementation and Configuration	Thursday 8:00	Grand Ballroom Salon G	Greg Daynes
14832	Web Apps using Liberty Profile Technology in CICS	Thursday 11:00	Platinum Ballroom Salon 2	Ian Mitchell
14722	Assimilating WebSphere Application Server into your z/OS WLM Configuration	Thursday 1:30	Orange County Salon 1	David Follis
15017	Using IBM WebSphere Application Server and IBM WebSphere MQ Together [z/OS & Distributed]	Thursday 3:00	Grand Ballroom Salon A	Ralph Bateman

The Big Picture –
how does IBM provide support

- **Modes of Support interaction**

- **Problem types and classification**

- **Key components of the Serviceability Strategy**
  - Serviceability Framework / Delivery Platforms
  - Knowledge and Education
  - Problem Determination tools
  - Serviceability features in the product runtimes

Modes of Support Interaction

Automation

Direct personal intervention

- Product or System self-healing

- Client Self-assist using electronic means

- Interact with IBM Support through electronic means

- Standard "phone" support

- Accelerated Value Program

- Critical Situations – "SWAT" teams

- Special IBM Services Engagements

Prevent Problems & Stay Current

Learn More

IBM Electronic Support

Find Information

Work With IBM Support

Download Fixes Updates

Troubleshoot Problems

Complete your session evaluations online at www.SHARE.org/Anaheim-Eval

Key Components of the Serviceability Strategy

- **Serviceability Framework / Delivery Platforms**
  - Web-based eSupport resources, Support Portal, **IBM Support Assistant (ISA), ISA Data Collector**, Fix Central, Archive Explorer, …

- **Knowledge and Education**
  - Technotes, Knowledge Engineering, IBM Education Assistant, WAS Support Technical Exchange, Problem Determination Courses, …

- **Problem Determination Tools**
  - Java Health Center, Memory Analyzer, Automated Analysis, Cross-component Trace Viewer, Trace and Request Analyzer, WebSphere Config Visualizer, …

- **Serviceability features in the product**
  - Log/trace, FFDC, hung thread detection, serviceability defect process, …

- **Metrics and PMR Causal Analysis**
  - RETAIN statistics, OPC, Aged PMR reviews, SWAT debriefs, ad-hoc PMR reviews, …

Many deliverables are the result of collaboration between many different teams – they are all discussed here without regard to origin

Addressing Common Challenges

Collecting Key Data

Challenge:
To resolve software issues, analyzing key data is essential, but it is often hard to locate and collect in a timely manner

Shorten time to resolution

Quickly collect diagnostic files or run traces that are predefined for products. View files easily and, optionally, send to IBM swiftly.

Troubleshooting Problems

Challenge:
Complexity of certain problems and configurations requires specialized tooling

Discover root cause

Problem determination tooling that allows diagnostics and analysis for problem resolution.
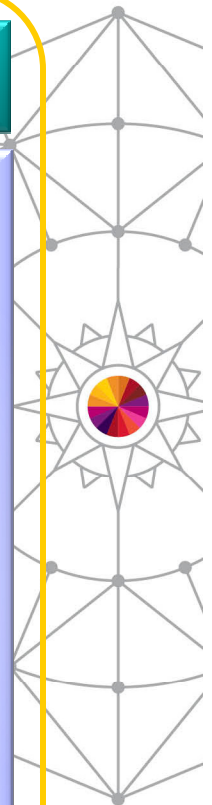
Troubleshooting problems

▪ Application coding errors ▪ Environment variables ▪ Performance tuning ▪ Configuration problems	Complex problems Symptom/solution discovery	▪ Many diagnostic files ▪ Many messages ▪ Importance of message

▪ Goal:
– Discover root cause

▪ Challenges:
– Complexity – certain problems and configurations require specialized tooling
– Discovery - symptoms can be difficult to uncover and match to knowledge

Some Notes about Problem Determination Tools

- **The development of Problem Determination tools within IBM is not centralized**
  - Various product teams, support teams and individuals create their own tools
  - The Serviceability Tools Team coordinates these various offerings and manages the platform
  - Trying to centralize as many tools as possible in IBM Support Assistant or integrated in a Product

- **Sometimes there will be several tools with overlapping functions**
  - Various individuals may have their preferences for one tool over another
  - The Serviceability Tools Team will help clarify and designate the tool(s) that are officially "preferred" by IBM for its Clients

- **Tools evolve over time**
  - Today's "best-of-breed" tool may be replaced by an even better one someday
  - The Serviceability Tools Team manages the orderly deprecation and withdrawal of older tools when appropriate

- **The current strategic push is towards server-based tools**
  - To facilitate deployment in cloud-type environments, such as IBM Support Assistant 5.0
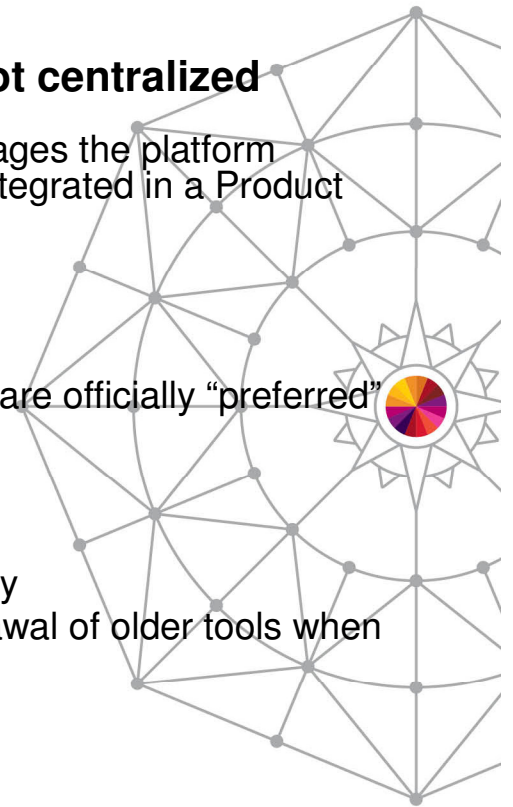
IBM Support Assistant
Workbench 4.1
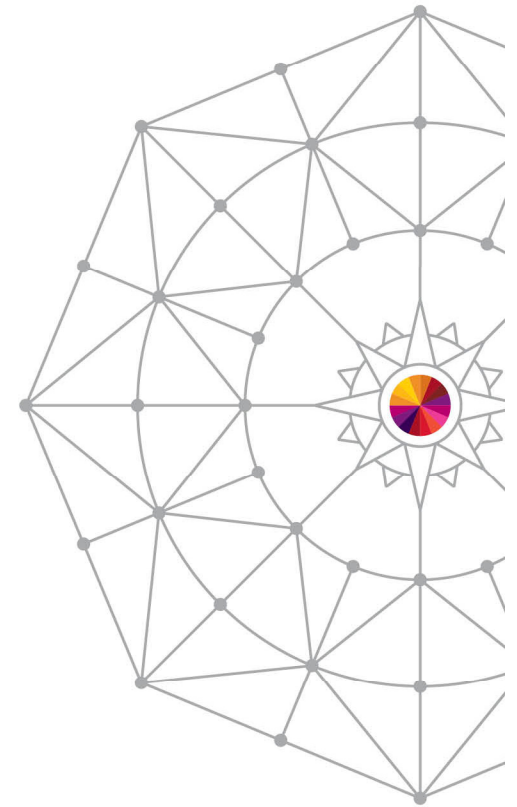
Specialized tool sources

Performance degradation

gc policy tuning

deadlocks

crashes

timeouts

Application hangs

memory leaks
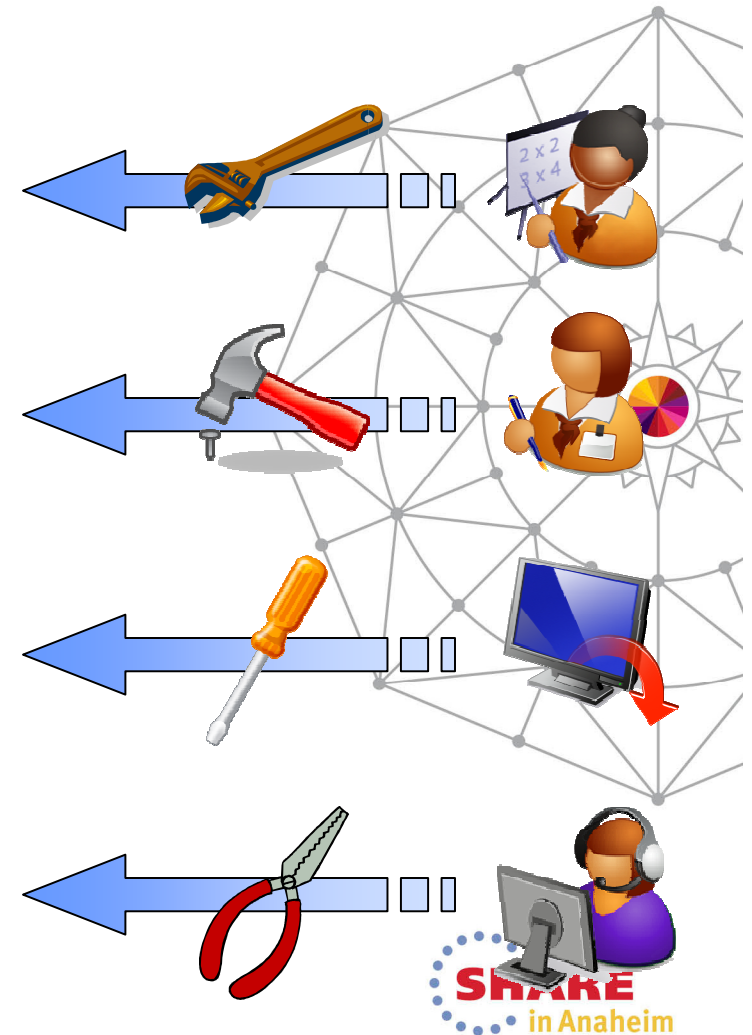
Complete your session evaluations online at www.SHARE.org/Anaheim-Eval

IBM Support Assistant –
One-stop toolbox
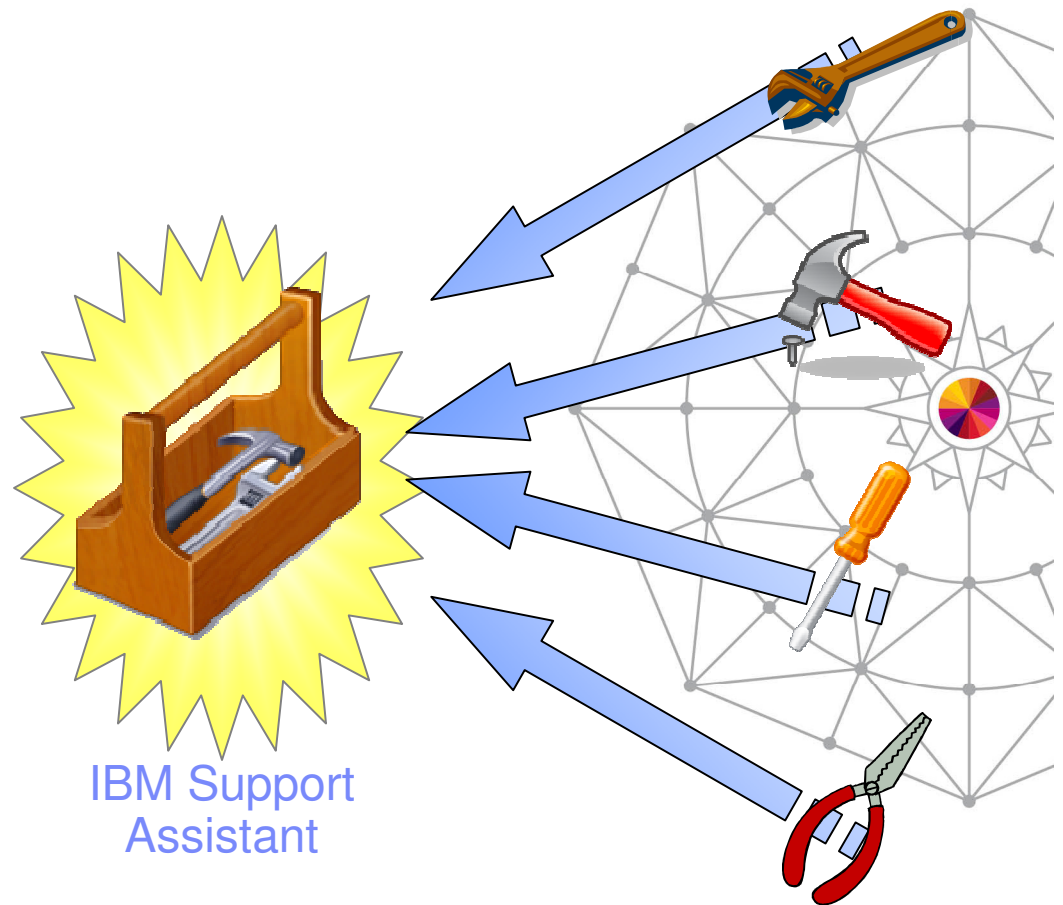
IBM Support Assistant

Today – IBM Support Assistant (ISA) Workbench

ISA Workbench 4.1

- Eclipse-based client

- Workbench is installed on each desktop (single user)

- Collect and organize diagnostic data (logs, traces, etc.)

- Find and use Problem Determination tools

- Search and browse support-related information about IBM products

- Open and manage PMRs *(phasing out)*

ISA WB

ISA WB

ISA WB

ISA WB
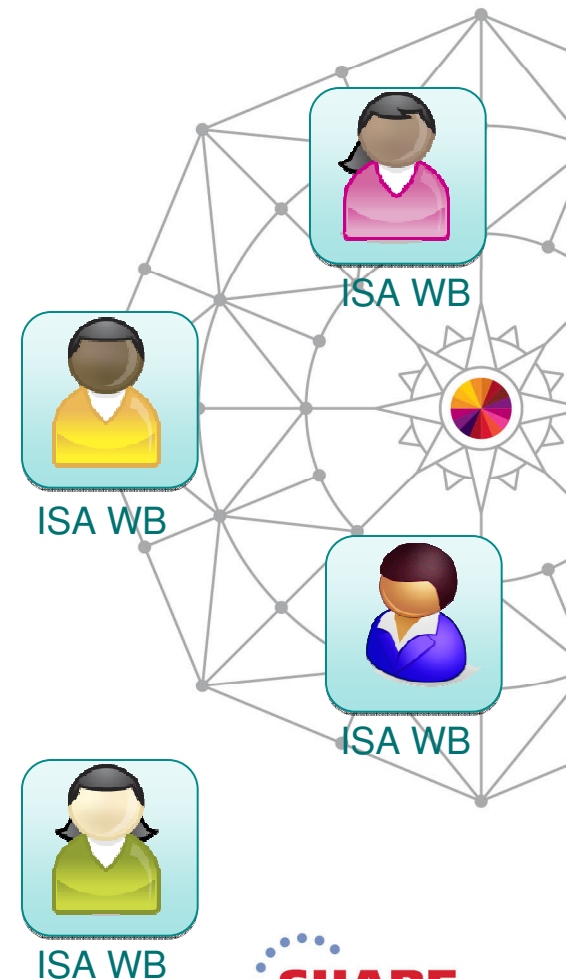
IBM Support Assistant Workbench 4.1

Desktop serviceability application

Provides you with the function and tools to analyze and diagnose your software problems
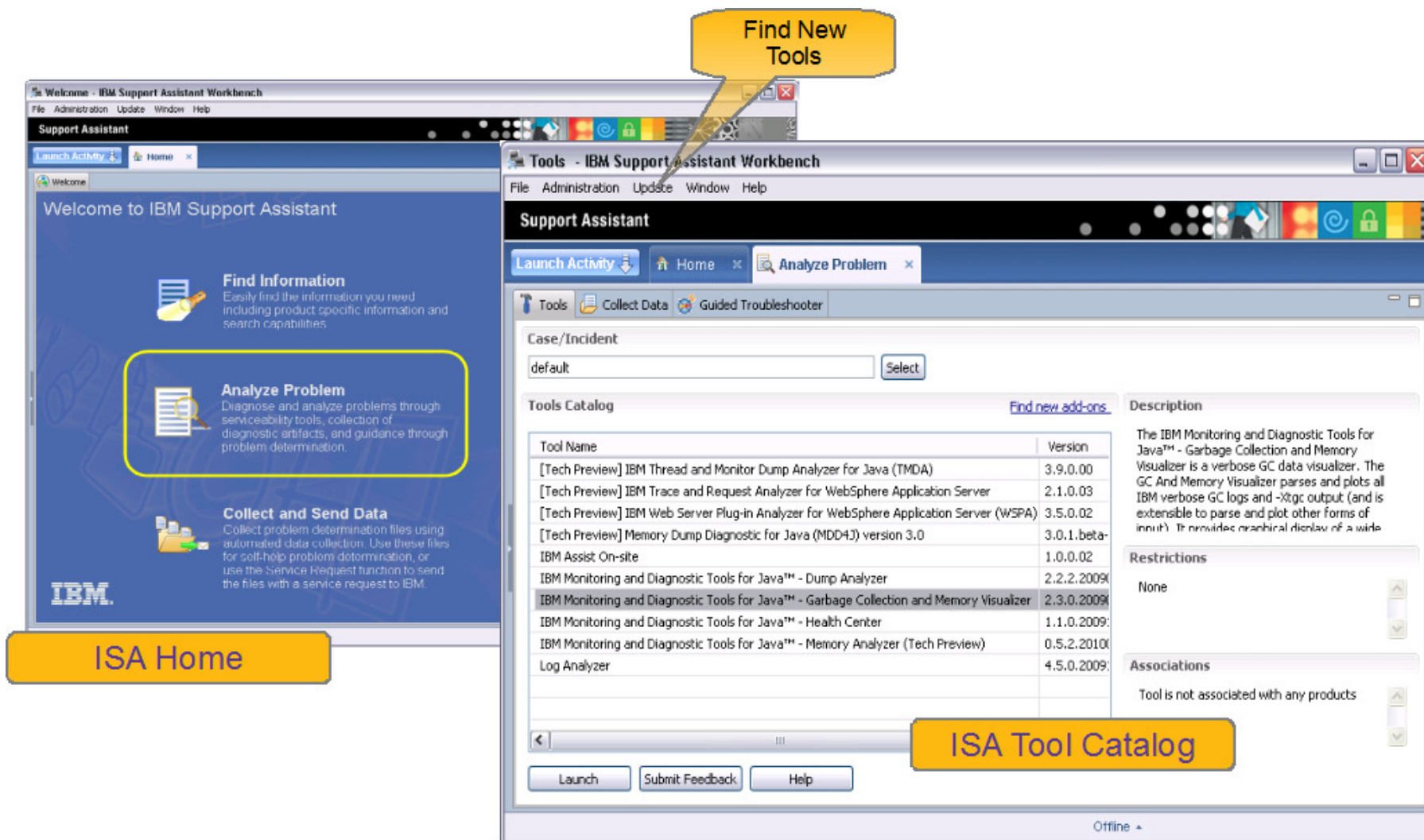
Over one hundred "add-ons" available for various IBM products

Tailored for your needs

ISA Workbench – Launching Tools

ISA Workbench – Diagnostic Tools

Cross-product Environment Troubleshooting

Log Analyzer

Guided Troubleshooter

Visual Configuration Explorer

Port Scanner Tool

Processor Time Analysis Tool for Linux

WebSphere Troubleshooting

Web Server Plug-in Analyzer for WAS

IBM Trace and Request Analyzer for WAS

Database Connection Pool Analyzer for WAS

WAS Analysis Module for Dump Analyzer

IBM Web Services Validation Tool

Java Troubleshooting

⭐ Memory Analyzer

⭐ IBM Thread and Monitor Dump Analyzer

Performance Analysis Tool

Memory Dump Diagnostic for Java

Heap Analyzer

⭐ Health Center

Multicore Software Development Kit for Java

⭐ Garbage Collection and Memory Visualizer

IBM Pattern Modeling and Analysis Tool

⭐ **Interactive Diagnostic Data Explorer**

Lotus Troubleshooting

Lotus Notes Diagnostic

Domino Configuration Tuner

IM / FileNet Troubleshooting

FileNet OSAR Cable Tool

Remote assistance

Assist on-site

Complete your session evaluations online at www.SHARE.org/Anaheim-Eval

SHARE in Anaheim

IBM Recommended Java Troubleshooting Tools

- **IBM Monitoring and Diagnostic Tools for Java**
    - Garbage Collection and Memory Visualizer (GCMV)
    - Memory Analyzer (MAT)
    - Health Center
    - Interactive Diagnostic Data Explorer *(new)*

- **IBM Thread and Monitor Dump Analyzer for Java (TMDA) [Tech Preview]**
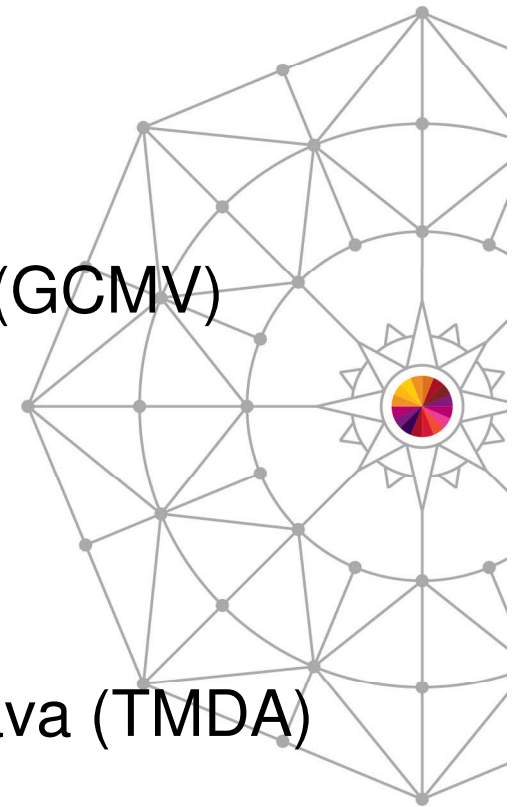
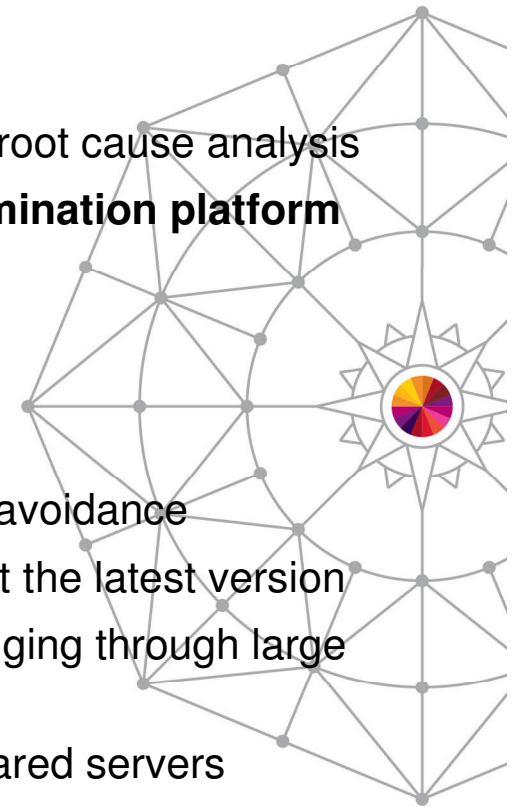# IBM Support Assistant 5
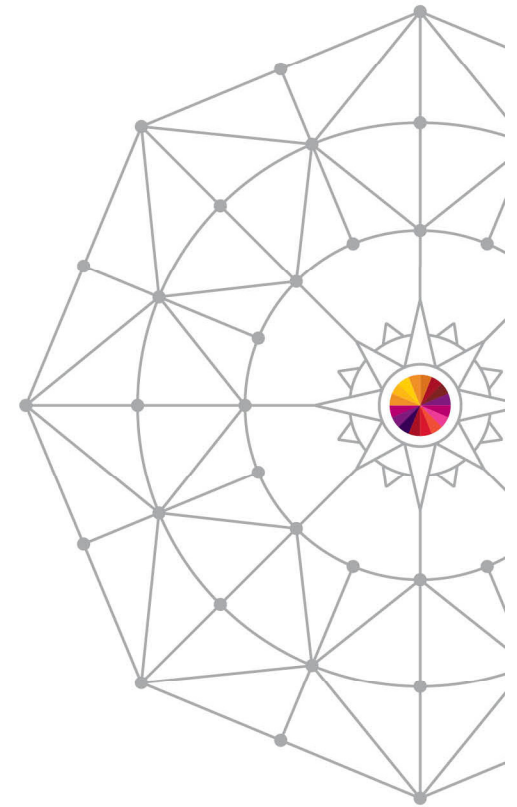
IBM Support Assistant 5

- **What is IBM Support Assistant 5?**
  - Application targeted toward users responsible for diagnostics and root cause analysis
  - A long-range strategy to produce a **collaborative problem determination platform**
  - A **convergence** and **next generation** of several tools

- **Benefit Focus areas**
  - **Cost avoidance** through reduction in time to resolution and PMR avoidance
  - **Saves time** installing/updating client software: click "refresh" to get the latest version
  - **Saves time, ensures completeness and consistency** when trudging through large volumes of diagnostic data to find that "needle in a haystack"
  - **Saves desktop resources** by off-loading heavyweight tools to shared servers
  - **Saves time** communicating with customers and collaborating between Support Engineers

IBM Support Assistant 5 Strategy

ISA 5.0 Team Server

- Server-based model

- Install once - shared by many team members via browser

- Web 2.0 browser interface

- Remote execution of PD tools

- Off-load analysis processing

- Collaboration on PD

- Case Management

- Tool Management

- Single-user option available

Browser

Browser

ISA
Team Server

Browser

Browser
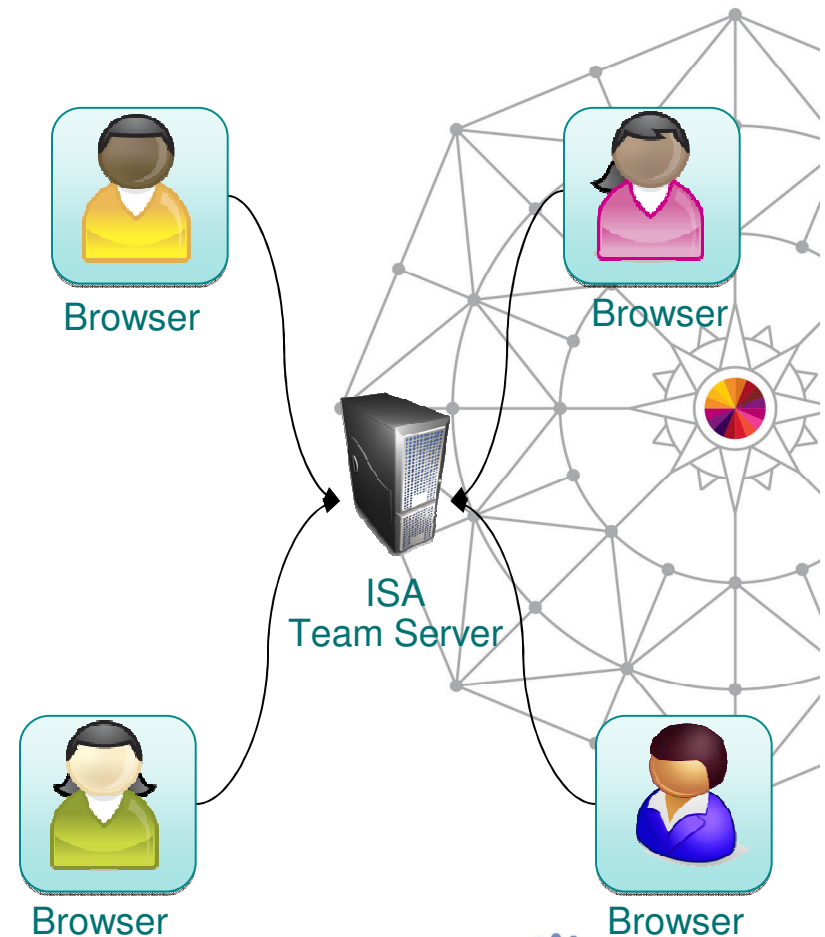
Available at www.ibm.com/software/support/isa

IBM Support Assistant 5.0 – Deployment options

SHARE
Technology · Connections · Results

Team Server
- Single install
- Multiple end users
- Leverages resources of ISA server system
- Shared investigation

ISA Lite

Custom Server

IBM Support Assistant

Internet

ibm.com Server
(ISA and Tool updates)
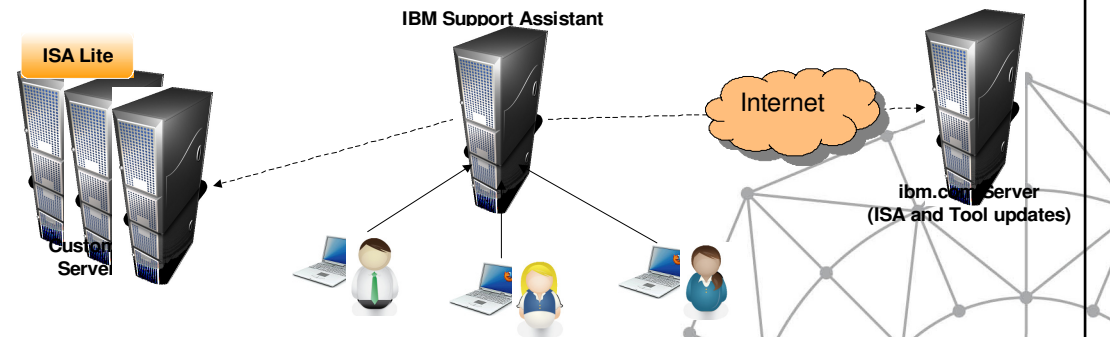
Standalone
- Single user
- Local install
- User administered

ISA Lite

Custom Server

IBM Support Assistant

Internet

ibm.com Server
(ISA and Tool updates)
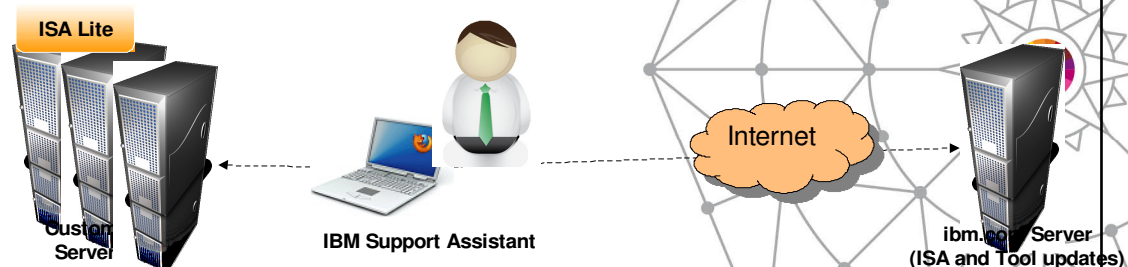
Cloud *(future?)*
- Zero install
- Multiple end users
- Leverages resources of ISA at ibm.com
- Shared investigation

ISA Lite

Custom Server

Internet

IBM Sup   nt
at i

SHARE
in Anaheim
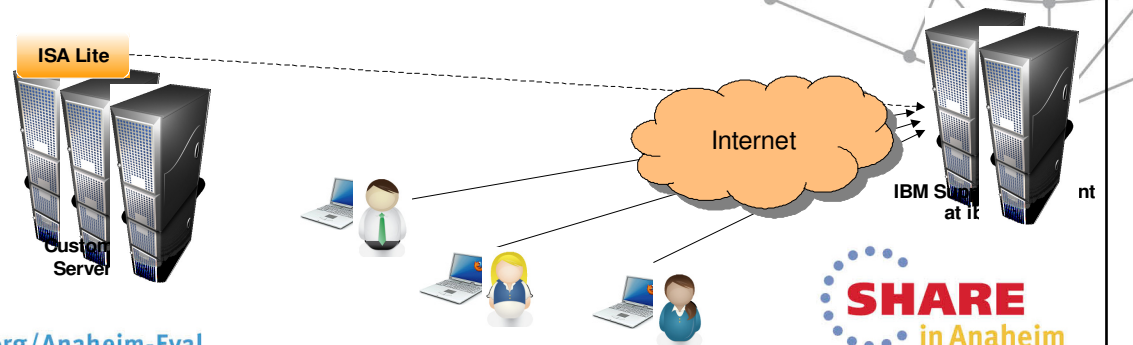
IBM Support Assistant 5.0 – Installation options

Installation Manager

Recommended

- *Managed install, uninstall and update*
- *Selective install of tools*
- *All-in-one solution – includes lightweight runtime*

IBM Support Assistant

Small runtime
(WAS 8.5 Liberty profile)

ISA App
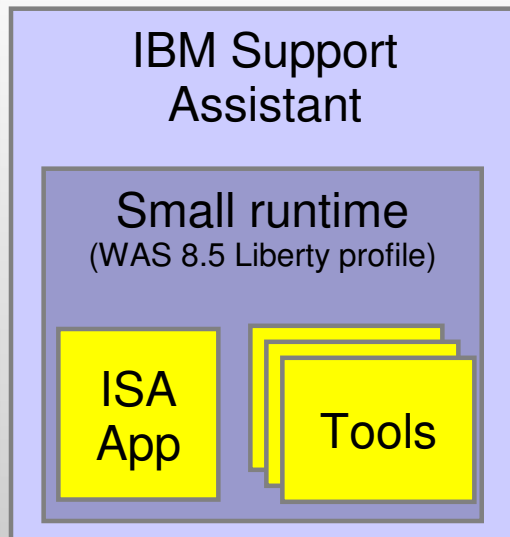
Tools

optional

EAR:
- *Deploy into existing Application Server*
- *Tools deployed as JEE web modules*

WebSphere Application Server at mycompany.com

ISA EAR

Tool X WAR
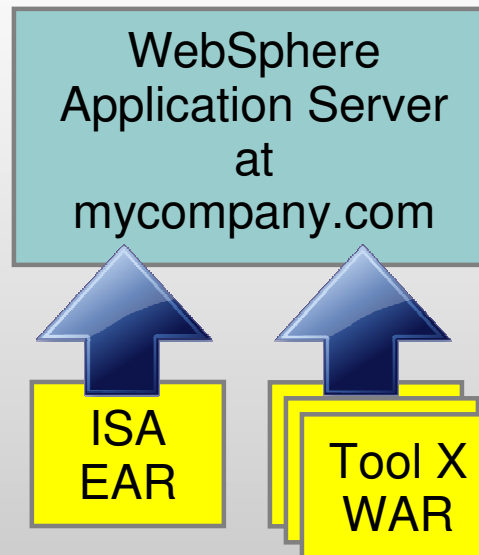
Compressed zip

- *Easy startup*
- *Unzip and go*
- *All tools included*
- *No update capabilities*

Complete your session evaluations online at www.SHARE.org/Anaheim-Eval

Case Management
Simplified organization

- Basic problem record capabilities
- Describe and capture notes about a symptom
- Container to organizer problem determination efforts
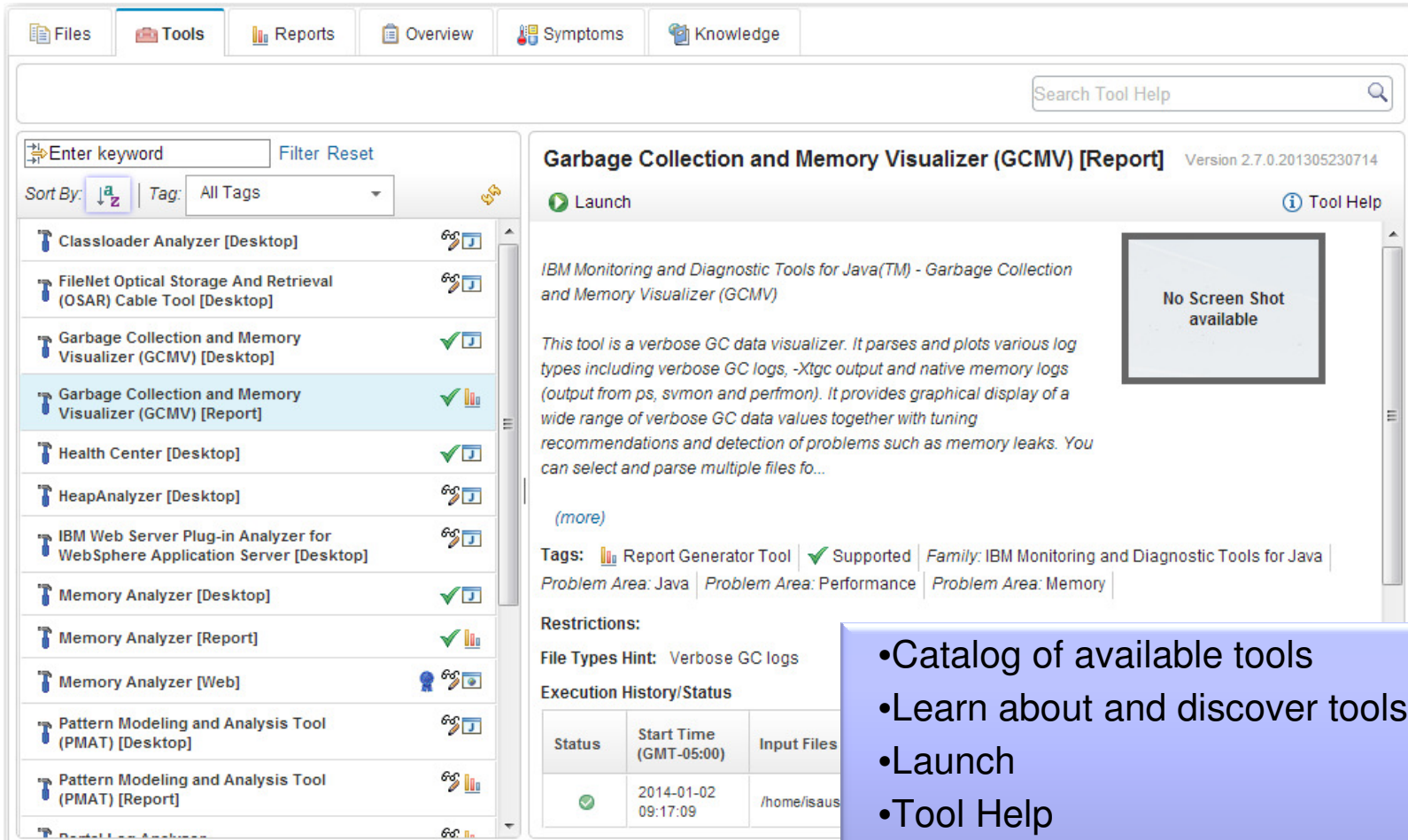- Share investigation with other team members

Complete your session evaluations online at www.SHARE.org/Anaheim-Eval

in Anaheim

File Management and File Actions

- Familiar file explorer interface
- Navigate, filter, and search across large numbers of files
- Invoke common actions against files and directories
- Easy upload and transfer

Tools – Toolbox

- Catalog of available tools
- Learn about and discover tools
- Launch
- Tool Help
- Execution History

Files – Launch tools

- Suggested tools based on file type
- Automatically pass files to a tool
- All tools available from the "Other…" menu
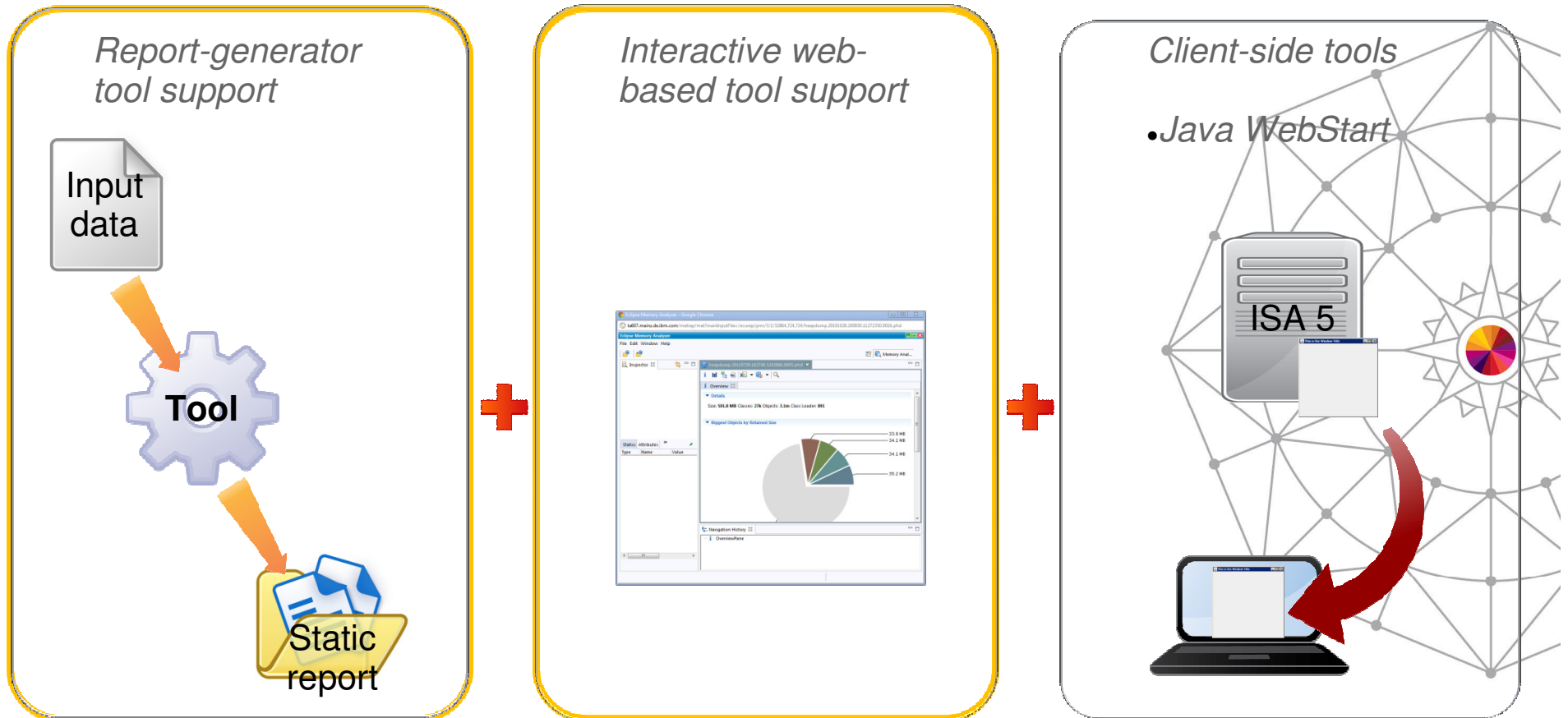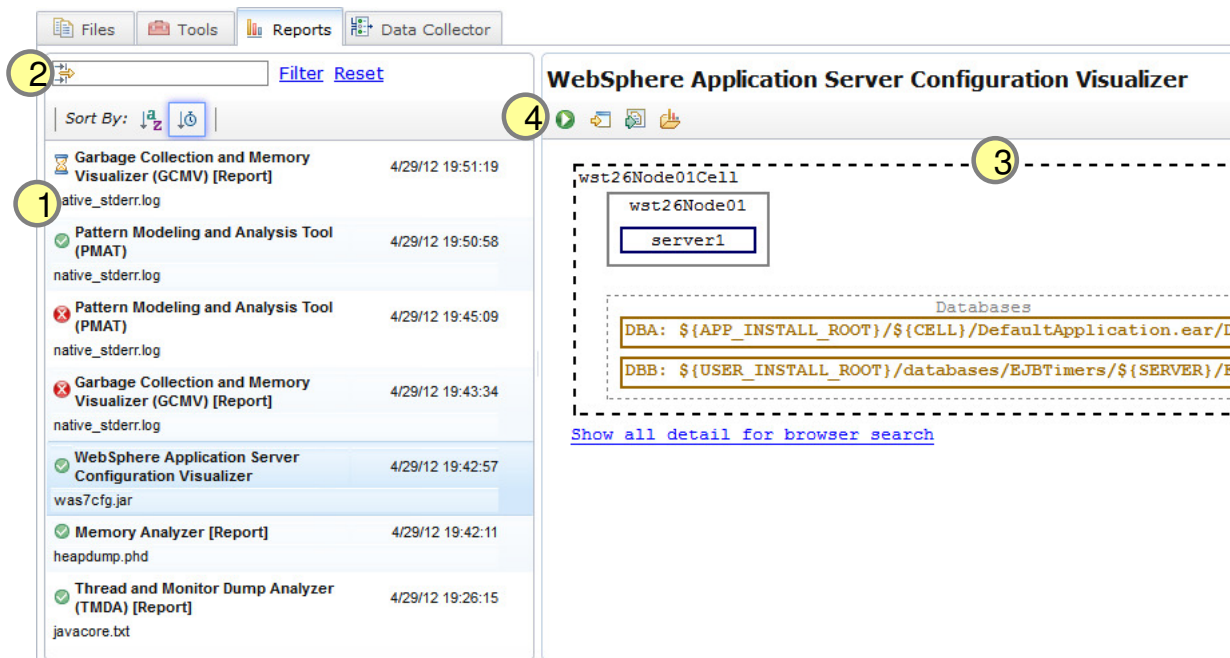
Complete your session evaluations online at www.SHARE.org/Anaheim-Eval

ISA 5 - Tools

Report-generator tool support

Input data

Tool

Static report

Interactive web-based tool support

Client-side tools

• *Java WebStart*

ISA 5

Strategic direction

SHARE
in Anaheim

Tooling Platform – Reports View

The Reports Tab provides a single view into all reports generated by tools within a case

----

1) Full list of reports
2) Filter and sort to easily locate reports
3) View reports directly in IBM Support Assistant
4) Relaunch tools and navigate directly to the report's input and output

Web-based Tool Support

Tool processing runs on the server and the rich, interactive UI runs in the browser
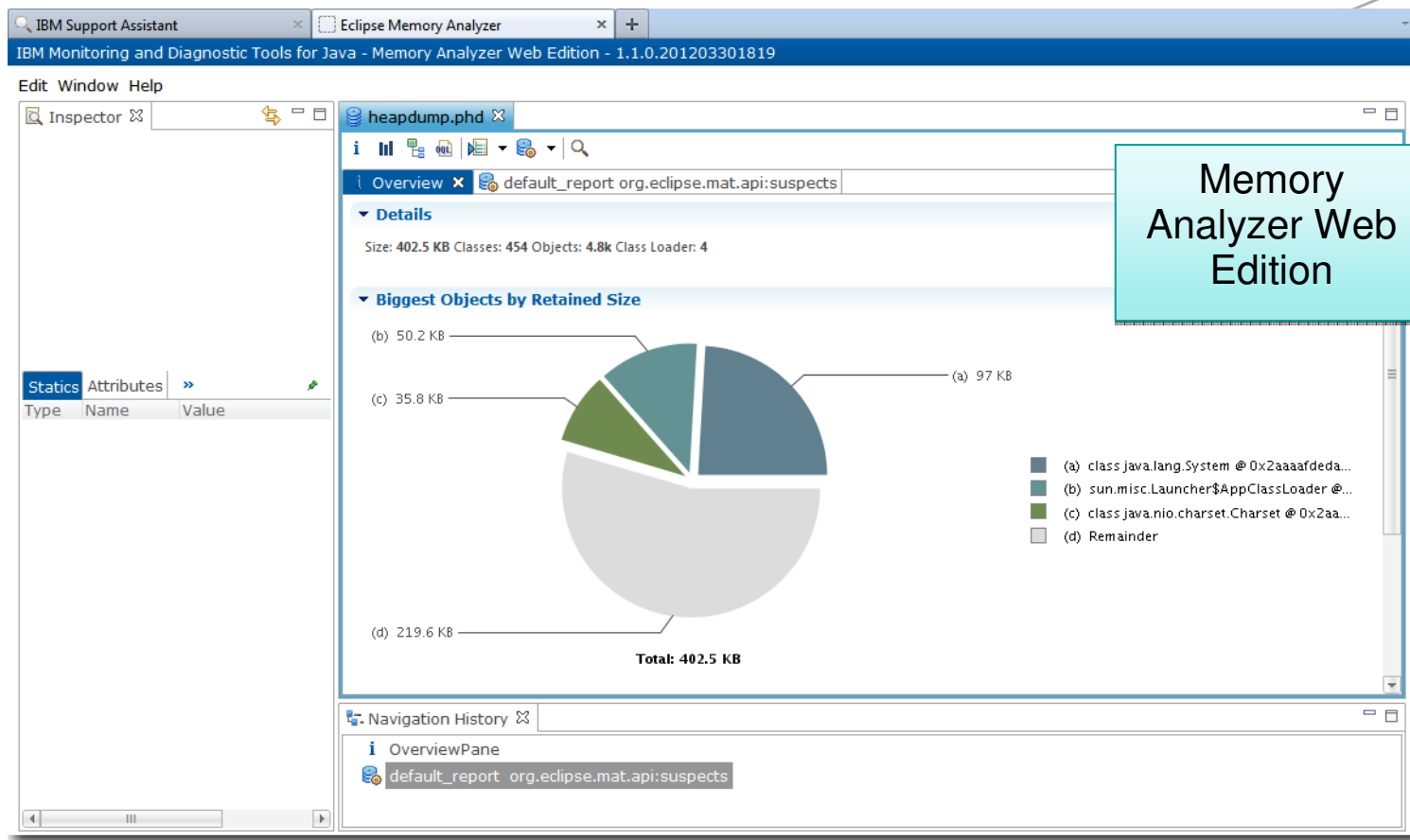
Memory Analyzer Web Edition

Desktop Tool Support

Client tools can be launched directly from the browser in
IBM Support Assistant through Java WebStart
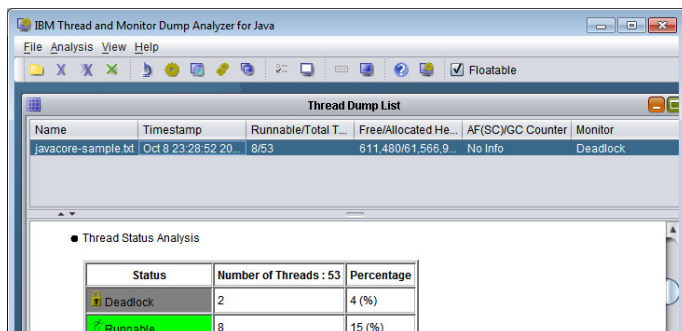
- Garbage Collection and Memory Visualizer
- Health Center
- Memory Analyzer
- Thread and Monitor Dump Analyzer
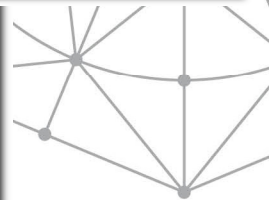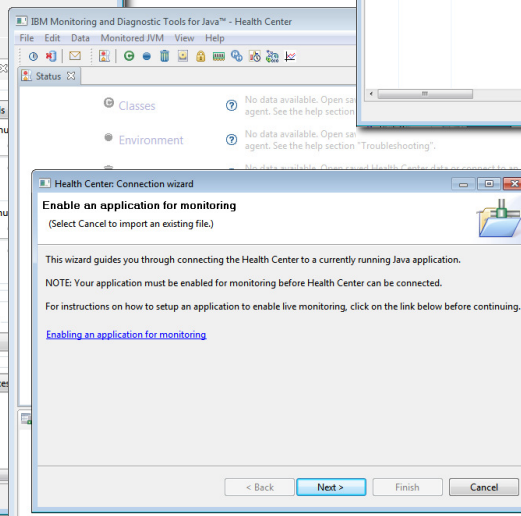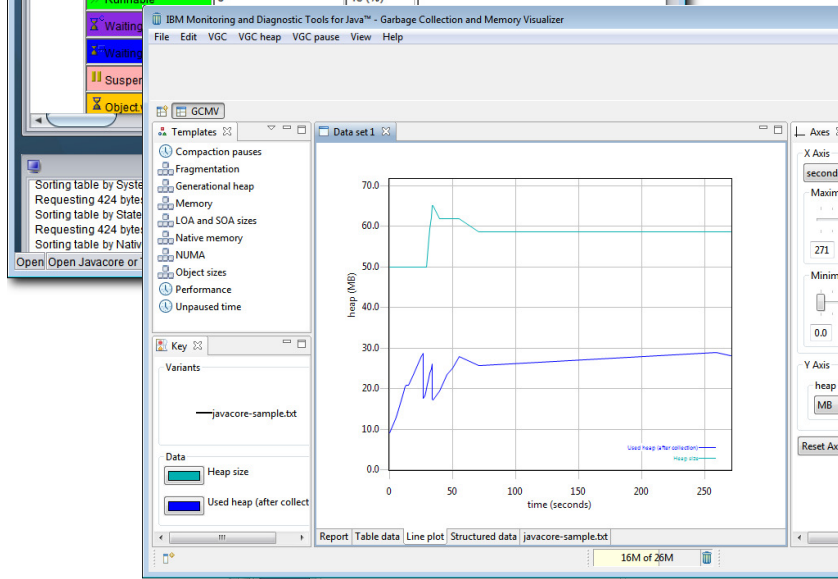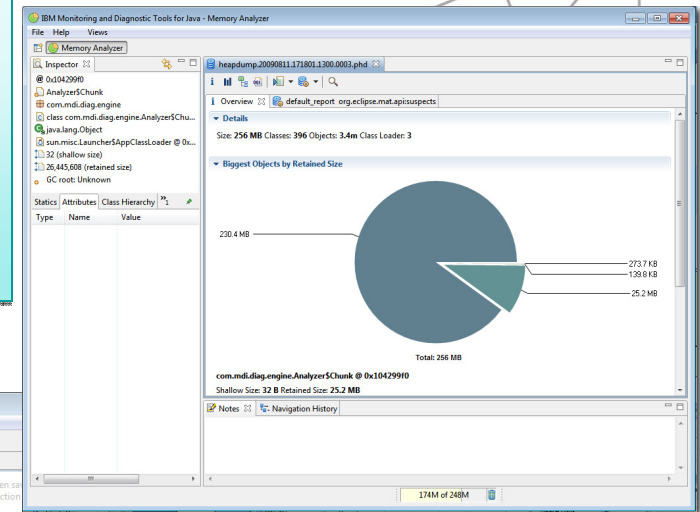
"Solve a Problem" Flow – Big picture

START

↓

Initial Characterization of the Problem

↓

Collect basic diagnostics

↓

Quick scan through basic diagnostics In Knowledge Base (common problems)

Found potential remedy

Found no remedy

Go to Phase 2

Attempt and evaluate remedy

Not OK

Remedy OK: DONE

Consult Knowledge Base / Expert System to decide on next PD step (specific to each problem and current state)

↓

Collect new specialized diagnostics (may or may not involve recreate)

↓

Analyze and interpret new diagnostics

Iterate until resolved

Found potential remedy

Found no remedy

Attempt and evaluate remedy

Not OK

Remedy OK: DONE

Phase 1

Phase 2

Automated Analysis (phase 1)

- Common tasks performed during a "first look"
  - Scan logs and other files looking for anomalies – "What stands out?"
  - Mentally rank symptoms
  - Use keywords to search known repositories
  - Review search hits and decide which seem "most likely"

- IBM Support Assistant automates steps that would probably be done by hand
  - Faster
  - More thorough

- Simplify the process of getting to root cause

Enhanced Files View

Files Tab
- Review details discovered in a file without opening the file
- Quickly identify time spans covered in a file
- See symptoms and KB Matches for a file at a glance

Automated Analysis – Overview

Overview Tab
• Review hundreds of files all summarized on a single page
• Data blocks organize information into useful chunks
• Drill down to individual files

Complete your session evaluations online at www.SHARE.org/Anaheim-Eval
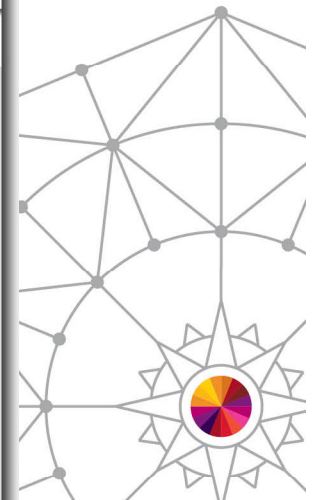
Automated Analysis – Symptoms

Symptoms Tab
- Extracted symptoms are displayed in an ordered list, ready for your inspection…
- Symptom information helps you determine which candidate you should investigate first
- Solution recommendations are matched to the selected symptom

Automated Analysis – Knowledge Base Matches

Tool Administration

- Manage Analysis tools
  - Install, uninstall, update
- Browse available tools
- Administrator credentials required

User Assistance

Help System
- Documentation available from banner
- Search Tool help from Tools tab
- Searchable Knowledge Center

Complete your session e

Contact Information

IBM Support Assistant Team Server Administration [18] ▾   Language ▾   ⊘ ▾   IBM.

- Help Center
- Forum & Support
- About
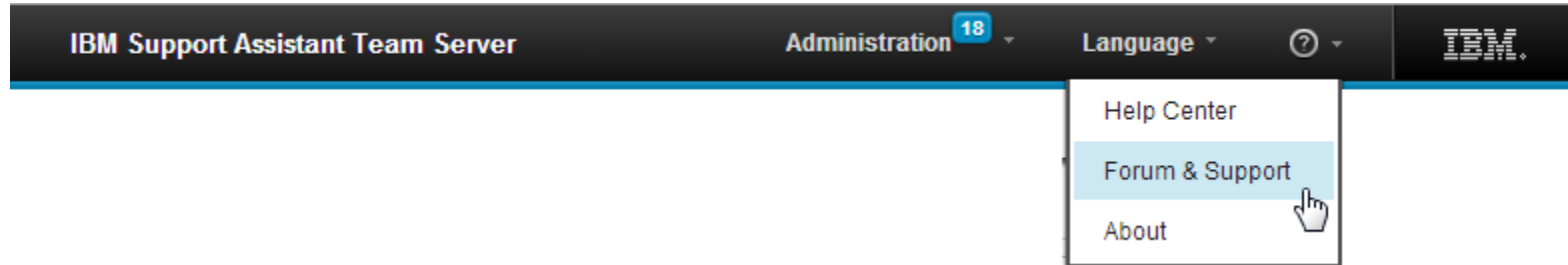
**Need support or have questions
about Team Server?**

Visit our forum:
https://www.ibm.com/developerworks/community/forums/html/forum?id=11
111111-0000-0000-0000-000000000935

IBM Support Assistant web page
http://www.ibm.com/software/support/isa
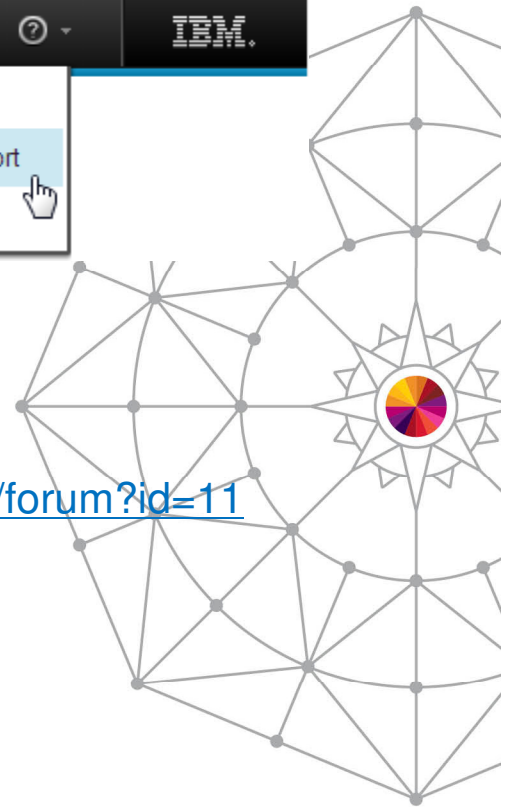
Thank you

**Questions
or
Comments**
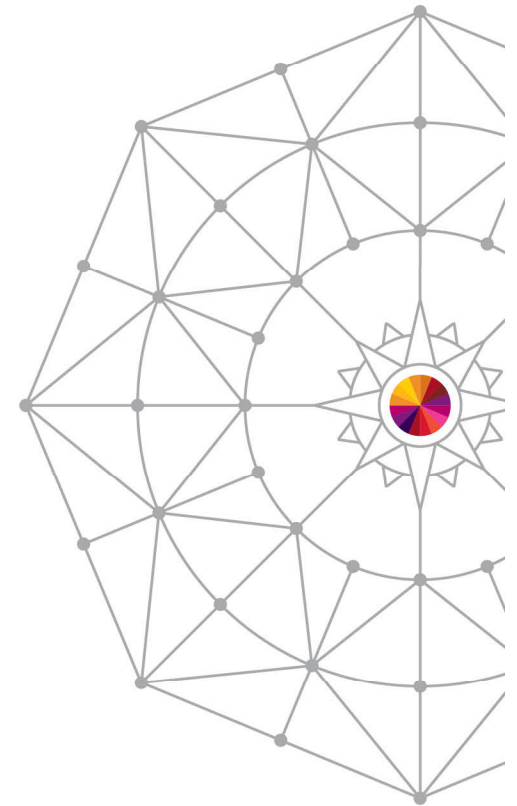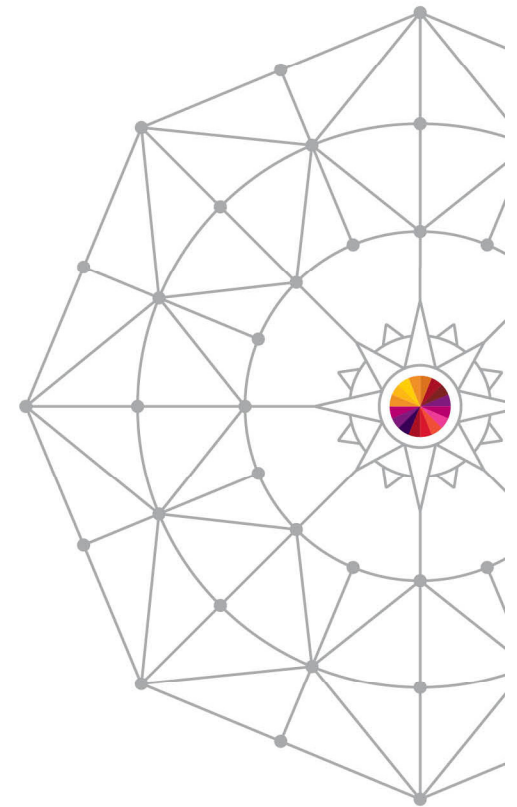
SHARE
in Anaheim

Backup Slides

Education

- **Many problems can be resolved or avoided by ensuring that the Users have the opportunity to learn the appropriate skills**

- **But Education is hard to deliver efficiently – who has time to go through thousands of hours of education materials on every subject that can possibly be useful to them**

Hence we need a rich a flexible set of education channels to suit each User's needs

- **Education is necessary both for a general range of topics about how to use various aspects of each product, but also specifically about how to perform Problem Determination tasks**

Tools and Resources

Items	Notes
WebSphere Education Services	Formal courses, both in-class and online, for a wide range of subjects. Typically for a fee. Two courses of particular interest for Problem Determination: ▪WebSphere Application Server Problem Determination (WU582) ▪WebSphere Process Server Problem Determination (WB225)
IBM Education Assistant (IEA)	Online, easy-to-consume, small granular education materials on common questions and problems encountered by Customers. Available for free. Some of the contents of the WAS Problem Determination course above are also available in IEA for self-study. Accessible directly through the web, or through the *Media Viewer* tool in ISA (allows offline viewing)

Education

Tools and Resources (continued)

Items	Notes
WebSphere Support Technical Exchange	Ongoing series of webcasts on topics of interest for WebSphere Support
IBM developerWorks	Ongoing series of articles on all technical topics, published through the web
Support Authority column on developerWorks	Semi-monthly column on topics of interest for WebSphere Support
	Published as part of the WebSphere Technical Journal
IBM Redbooks	Extensive collection of books and papers, written by IBM experts

Reference Information

- **The investigation of most problems involves finding the appropriate information in a global *knowledge base* containing instructions about how to troubleshoot each specific problem, and entries about specific known issues and APARs**

Tools and Resources (continued)

Items	Notes
Search engine on the eSupport web sites/portal	Searches through a broad range of online resources, including Information Centers, Technotes, APAR database, developerWorks, Redbooks, forums, …
	Results can be filtered by type and product, and organized in tabs for different types of results.
Product Information Centers	The primary reference documentation for each product.
	Most Information Centers contain a section on troubleshooting tools and techniques for the associated product..
	Searchable directly or through the eSupport web sites/portal or through ISA.
Technotes and related documents	Collection of notes on known issues, APARs, troubleshooting tips, how-to's. Stored in association with each product's eSupport web site/portal
	Managed by the IBM Support Engineers and Knowledge Engineers.
	Most products have a special collection of Technotes with instructions on how to troubleshoot each type of problem: *MustGather* and *Troubleshooting Documents*.
Diagnostic Guides	Some products (e.g. IBM Java) have a special *Diagnostic Guide* document, or other forms of troubleshooting guides.

Reference Information

Tools and Resources

Items	Notes
Automated search during the automated analysis in ISA 5.0 *(New)*	While performing automated analysis, ISA 5.0 automatically performs a number of standardized searches in a custom Knowledge Base derived from Technotes, APARs, etc.
Search function in ISA 4.1 *(Phasing out)*	Contains a search engine that aggregates (and filters) results from many sources (similar to the eSupport web sites/portal, but with additional configurable search targets)
	Results are organized according to the set of product add-ons installed in the user's ISA workbench
Product Information function in ISA 4.1 *(Phasing out)*	A set of links and RSS feeds for recommended information sources for each product add-on configured in the workbench.
IBM Guided Troubleshooter, a.k.a. IBM Guided Activity Assistant (IGAA) *(Phasing out)*	Provides step-by-step guidance while performing many troubleshooting tasks.
	Contains many "*flows*" for common problems in several products
	Integrated in ISA

Operational Preparation

- **Preparation is at least 50% of the battle: define, review and enhance a complete set of procedures to follow and associated resources to use to facilitate problem determination.**

- **Focus initially on how to best take advantage of the existing tools and techniques, and how to be as efficient as possible in problem determination.**

- **Several published articles can be used as a starting point for this activity:**

Special Activities (continued)

Items	Notes
Prepare a detailed **Architecture Diagram**	Used to identify key monitoring and diagnostic points, to communicate effectively during troubleshooting, and to help identify unexpected changes in configuration.
Prepare a **Diagnostic Data Collection Plan**	To avoid loss of time and loss of information when a problem does occur. Take advantage of automated data collection facilities in ISA.
Prepare a **Monitoring Plan**	To effectively detect problems as soon as they occurs, or preferably while they are still emerging
Prepare a **Relief and Recovery Plan**	For mission-critical systems, to minimize down-time when a problem occurs
Prepare a **Maintenance Plan**	To minimize disruptions and problems due to delayed or improper maintenance
Collect **baselines** of all major diagnostic data sources	To compare when a problem occurs and detect anomalies. May be part of a regular practice to perform *health checks*.
Document the most likely **failure scenarios** and the diagnostic collection and analysis procedure for each	To ensure that the necessary diagnostic resources (including tools and knowledge) are ready before they are needed
Maintain a **Change Log** of all significant changes in the environment	To prevent or help diagnose newly-emerged problems. Perform regular checks to ensure the change log remains current.
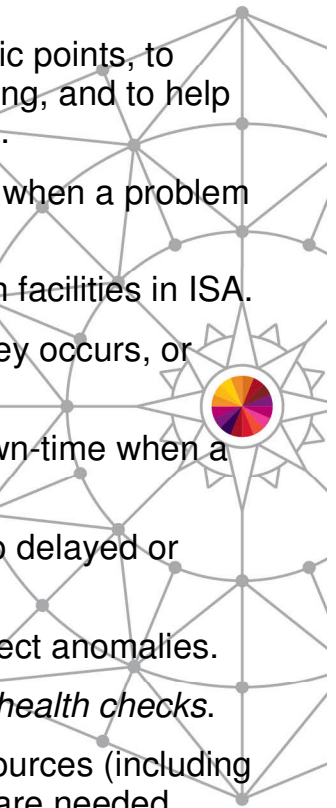
Collecting Diagnostic Data

- **Most troubleshooting scenarios consist of one or more iterations of collecting diagnostic data from a failed system then analyzing that data**

- **IBM Support has formalized this process and the set of diagnostic data to be collected for each of many types of problems that occur with each product**

- **The standardized set of collected diagnostic data is an important part of the exchange of information when working with IBM Support to resolve a PMR, and also when using the procedures and tools developed by IBM Support in a self-help situation at the Client's site**

Tools and Resources

Items	Notes
MustGather documents	A collection of special Technotes, each describing the exact set of diagnostics to collect for one particular problem type in one particular product.
ISA Lite / ISA Data Collector – downloadable edition	An alternative for using the same automated data collections scripts provided with ISA 4.1, but without requiring the installation of an agent on each remote system. The user must run the ISA DC tool manually on each target system.
ISA Data Collector – Web-enabled edition *(New)*	Similar to the downloadable ISA Lite, but run directly as an applet from a browser, without explicit download and installation. Available in ISA 5.0 and directly from the ISA web page on ibm.com/support/isa
ISA Data Collectors bundled with products *(New)*	More and more, the ISA DC or other sophisticated data collectors are bundled with the individual products to which they apply (for example in <was-install>/bin/isadc.bat or isadc.sh

Collecting Diagnostic Data

Tools and Resources (continued)

Items	Notes
Automated data collection function in ISA 4.1 *(Phasing out)*	ISA includes a collection of collection scripts that correspond to many of the most common MustGathers for each product
	Each script performs all the necessary actions with minimal user intervention, and packages the result as a jar file that can be sent directly to IBM Support, or analyzed locally.
	The ISA workbench can connect to an agent on each system in the Client's environment to collect the date from a remote system.
ECuRep file repository	A special repository hosted by IBM, to which Clients upload their diagnostic artifacts in connection with a PMR (normally via FTP)
	IBM Support has special tools to facilitate the management and analysis of artifacts on this repository.
Case Manager function in ISA	A function in ISA to help keep track and manage the various diagnostic artifacts collected during a troubleshooting sessions.
	Includes the capability to easily examine the contents of collection archive files created by the automated data collection facilities.
IBM Java Diagnostic Collector Tool	A special utility that can be installed with a IBM JDK to facilitate the generation and collection of diagnostics when that JDK crashes.

Collecting Diagnostic Data

Special Activities

Items   **Notes**

Create specialized collection scripts customized
for the Client's environment
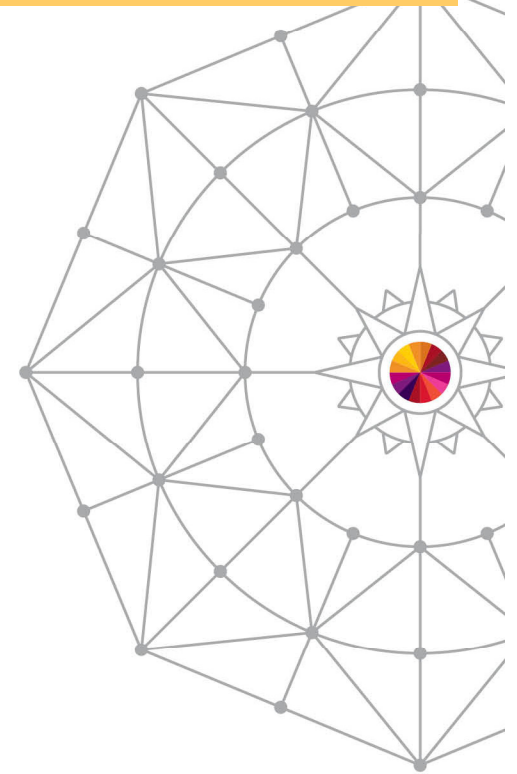
High-level log analysis and "Phase 1 Problem Determination"

- **A very substantial fraction of all problems encountered by Customers are relatively readily identifiable by examining logs and recognizing a key symptom in a database of known problems**

- **We have defined a process called "Phase 1 PD" to take advantage of this situation**

Runtime Features

Items	Notes
Standard logs, dumps and config files from each product	

Tools and Resources

Items	Notes
Automated analysis in ISA 5.0 *(New)*	ISA 5.0 contains a feature to perform a scan of all the files present in a ISA case and flag many anomalies found in these files
Server Logs Viewer in WebSphere Application Server admin console (including HPEL viewer) *(New)*	The WSAS admin console contains various functions to view and filter through the server logs
Cross Component Trace Viewer (XCT) *(New)*	Can be used to quickly scan through multiple logs and highlight high-severity errors (ignoring of the full trace analysis functions)
Log Analyzer (LA) and Symptom Databases *(Phasing out)*	Consolidates and visualizes many logs from many products. Easily flag anomalies within the large quantity of log data.
Server Logs Viewer in WebSphere Integration Developer	Can be used to quickly scan WPS logs for exceptions and errors (the core of Phase 1 PD)

Working with Java and WebSphere Trace

Tools and Resources	
Items	**Notes**
Cross Component Trace Viewer (XCT) *(New)*	Viewer for cross-component trace (XCT)
IBM Trace and Request Analyzer	Specialized tool for analysis of delays in request processing
IBM Database Connection Pool Analyzer	Specialized tool for analysis of problems related to the WebSphere connection pool
Trace Analyzer for WebSphere Application Server	General-purpose tool to facilitate sophisticated trace analysis by experts
Server Logs Viewer in WebSphere Integration Developer	Currently used for WPS only. Viewer for cross-component trace (XCT)

Special Activities	
Items	**Notes**
Document the process for diagnosing common problems in the Client's environment from examination of traces	Collect baseline traces during normal operation for comparison
Write specialized trace analysis scripts for common problems	

Working with Java and WebSphere Dumps

- **Dump analysis is complementary to trace analysis; it focuses on taking a snapshot of the state of system, and trying to determine if anything is abnormal and how we got to that state.**
- **There are many different types of "dumps", with varying degrees of completeness and cost**

Runtime Features	
Items	**Notes**
Javacore / thread dumps	Most common JVM artifact; simple text file with most commonly-used information. No detailed information about individual objects.
Heap dumps	Special dump used to diagnose memory conditions; smaller than system dump but less complete information
System dumps / svcdump	Most expensive but most comprehensive dump; an effort is underway to standardize on this type of dump for most cases.
Diagnostic Tooling Framework for Java (DTFJ)	Runtime support and API for producing and analyzing system dumps from a JVM
WebSphere Diagnostic Providers *(Phasing out)*	Provides specialized dumps, tests of individual components

Working with Java and WebSphere Dumps

Tools and Resources

Items	Notes
IBM Thread and Monitor Dump Analyzer (TMDA)	Analyzes javacores/thread dumps
Memory Analyzer (MA or MAT)	Expert tool for analyzing heap dumps and system dumps, with special focus on issues related to memory usage
Heap Analyzer (HA)	Analyzes heap dumps, with strong heuristics for memory leaks
Interactive Diagnostic Data Explorer (IDDE) *(New)*	Expert tool for analyzing system dumps; lighter-weight and more extensible than Memory Analyzer
Dump Analyzer (DA) *(Phasing out)*	Analyzes system dumps; extensible collection of analysis modules to diagnose different problems.
WebSphere Application Server modules for Dump Analyzer, Memory Analyzer and/or IDDE *(New)*	Specialized modules to examine WSAS-level information
IBM Whole-system Analysis of Idle Time Tool (WAIT) *(New)*	Cloud-based tool for analyzing a sequence of javacores, with special emphasis on performance issues
Memory Dump Diagnostic for Java (MDD4J) / Yeti *(Phasing out)*	Analyzes heap dumps; positioned as tool for non-experts..

Special Activities

Items	Notes
Promote and organize the systematic collection of dumps during incidents	
Implement specialized modules for Memory Analyzer or IDDE for the Client's environment	

Working with WebSphere Performance Sensors

- **Performance sensors are not typically thought of for problem determination, but they can be used to detect various anomalies that are important clues for diagnostics**

Runtime Features

Items	Notes
Performance Monitoring Infrastructure (PMI)	Many sensors/counters for key performance indicators
Advanced Request Metrics	Allows fine-grained tracing of the progress of a transaction
WebSphere Runtime Performance Advisor	Dynamically monitors PMI metrics and warns of anomalies

Tools and Resources

| Items	Notes
Tivoli Performance Viewer	Basic viewer for PMI data
	Embedded in the WebSphere Admin Console
Performance Tuning Toolkit (PTT) *(New)*	Advanced viewer for PMI data; can perform live monitoring and alerting and guide tuning activities
Advanced Tivoli tooling, esp. ITCAM	Sophisticated analysis of PMI and ARM data
Monitoring/health facilities in WS VE, XS	

Working with WebSphere Performance Sensors

Special Activities

Items

Collect baselines and review PMI sensors
during normal operation, to help recognize
common problems

Notes
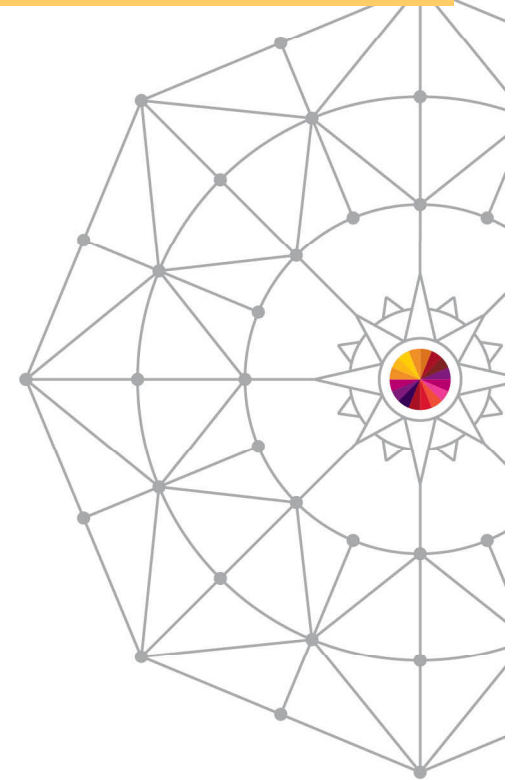
Using "pings" for Monitoring and Diagnostics

- **Most troubleshooting techniques are based on observing and extracting information that already exists in the system as part of its normal (or abnormal) operation.**
- **Another technique, which is used relatively rarely but which can be extremely powerful, consists of actively exercising parts of the system with known inputs to observe the resulting outputs.**
  - For example, by injecting artificial requests at regular intervals, whose processing is completely predictable if the system is healthy. By observing how the actual processing of these requests happens, we can learn a lot about what is going on in the system.
  - By carefully choosing different requests that each exercise only a portion of the overall system, we can also identify which portions of the system are currently healthy or un-healthy.

Runtime Features	
Items	**Notes**
Advanced Request Metrics	Use primarily for performance, but can also be used in some cases for "ping" style health checks

| Tools and Resources	
Items	**Notes**
Tivoli tooling	Tivoli has a collection of tools that monitor systems through synthetic transactions
Ad-hoc scripts	Often, Clients implement their own ad-hoc "ping" scripts based on specific understanding of their particular system architecture

Using "pings" for Monitoring and Diagnostics

Special Activities

Items

Design and implement a collection of ad-hoc "ping" scripts for the Client's environment

Notes
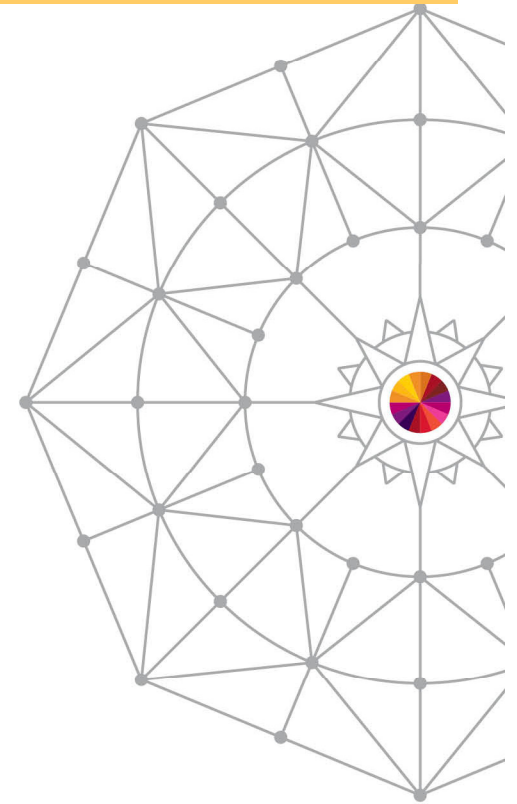
Specialized runtime features for common problems

- **The WebSphere runtime is steadily being enhanced to include special diagnostics for common problems**

- **This type of feature makes is most easy to detect a particular problem, but they typically can only be implemented with new product releases, i.e. on a relatively long cycle**

Runtime Features

Items	Notes
Database connection test function	Simple function in the WebSphere Admin Console to test that a database connection is currently working
Hung Thread Detection	Notifies when threads have been unresponsive
Connection Leak Detection	Notifies when database connections are "leaked"
Session data crossover detection	Runtime checks that warns when it appears that information is unintentionally "leaking" between two HTTP sessions
First Failure Data Capture (FFDC)	Captures information for all unexpected exceptions
Classloader Viewer	Captures information about how classes are loaded in WebSphere
	Viewer is embedded in the WebSphere Admin Console
Memory leak detection and protection *(New)*	Detect/fix common causes of leaks associated with app stop
… others …	

WebSphere Application Server on System Z

Session	Title	Time	Room	Speaker
14618	Getting Started with WebSphere Liberty Profile on z/OS	Monday 9:30	Grand Ballroom Salon C	Loos/Follis
14692	Getting Started with WebSphere Compute Grid	Tuesday 9:30	Grand Ballroom Salon J	Hutchinson/Loos
14693	Using WebSphere Application Server Optimized Local Adapters (WOLA) to Migrate Your COBOL to zAAP-able Java	Wednesday 9:30	Grand Ballroom Salon K	David Follis
14620	WebSphere Liberty Profile on Windows AND z/OS (among other things) Hands-on Lab	Wednesday 1:30	Platinum Ballroom Salon 7	
14949	Tips Learned Implementing Websphere Application Server (WAS) on Linux for IBM System z	Wednesday 3:00	Grand Ballroom Salon G	Eberhard Pasch
14709	Need a Support Assistant? Check Out IBM's! (ISA)	Thursday 8:00	Grand Ballroom Salon A	Mike Stephen
15050	z/OSMF 2.1 Implementation and Configuration	Thursday 8:00	Grand Ballroom Salon G	Greg Daynes
14832	Web Apps using Liberty Profile Technology in CICS	Thursday 11:00	Platinum Ballroom Salon 2	Ian Mitchell
14722	Assimilating WebSphere Application Server into your z/OS WLM Configuration	Thursday 1:30	Orange County Salon 1	David Follis
15017	Using IBM WebSphere Application Server and IBM WebSphere MQ Together [z/OS & Distributed]	Thursday 3:00	Grand Ballroom Salon A	Ralph Bateman