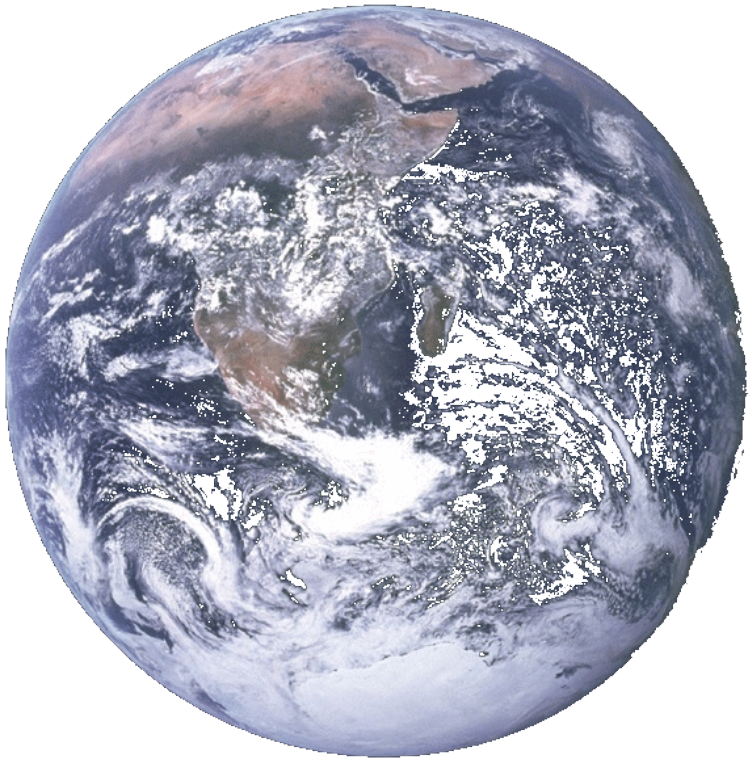
IBM Tivoli Support and Services

The Importance of Middleware for TPAE Applications

Overview



- **Understanding TPAE**
- **What is middleware (MW)**
- **How does TPAE use MW**
- **How does MW enhance TPAE**
- **How does MW impact TPAE**
- **Questions**

Understanding the Tivoli Process Automation Engine (TPAE)

- **All TPAE applications require:**
  - Database Connections
  - Security and Authorities
  - Cron Tasks, Escalations, Workflows
  - Reporting
  - Integration
  - Configuration and Application Design
- **The TPAE architecture builds these capabilities as a common component and applications built on this architecture can leverage the tools without reinventing the wheel.**
- **TPAE allows for a “design once, use many times” approach to stable application development.**

TPAE Applications

- **Maximo**
- **Maximo Industry Solutions**
  - Nuclear, Oil and Gas, Transportation, Government, Utilities
  - Spatial, Calibration, Asset Configuration, Life Sciences
- **Change and Configuration Management Database (CCMDB)**
- **Service Request Manager (TSRM)**
- **Asset Management for IT (TAMIT)**
- **Service Automation Manager (TSAM)**
- **Process Manager (TPM)**

- **All of these applications get the benefit of TPAE without having to code this functionality.**

What is middleware?

- **The term middleware implies that it is between….**
  - Users do not typically directly access middleware. It serves a supporting role only.
- **TPAE products rely on middleware functionality**
- **TPAE is a java J2EE product that requires a J2EE application server (MW)**
- **TPAE uses databases to store data (MW)**
- **You can think of any software technology that is required to support the functionality of an application as middleware.**

How Does TPAE Use Middleware? (J2EE)

- **TPAE applications are J2EE compliant**
  - Separates UI from functional code
- **J2EE applications require J2EE servers**
- **J2EE Servers provide JMS queues for integration**
- **J2EE Servers provide a security layer for LDAP**
- **J2EE Servers provide DB connection pooling BUT**
  - TPAE applications do not use this. TPAE has its own database connection pooling.
- **J2EE Servers provide scalability and high availability**

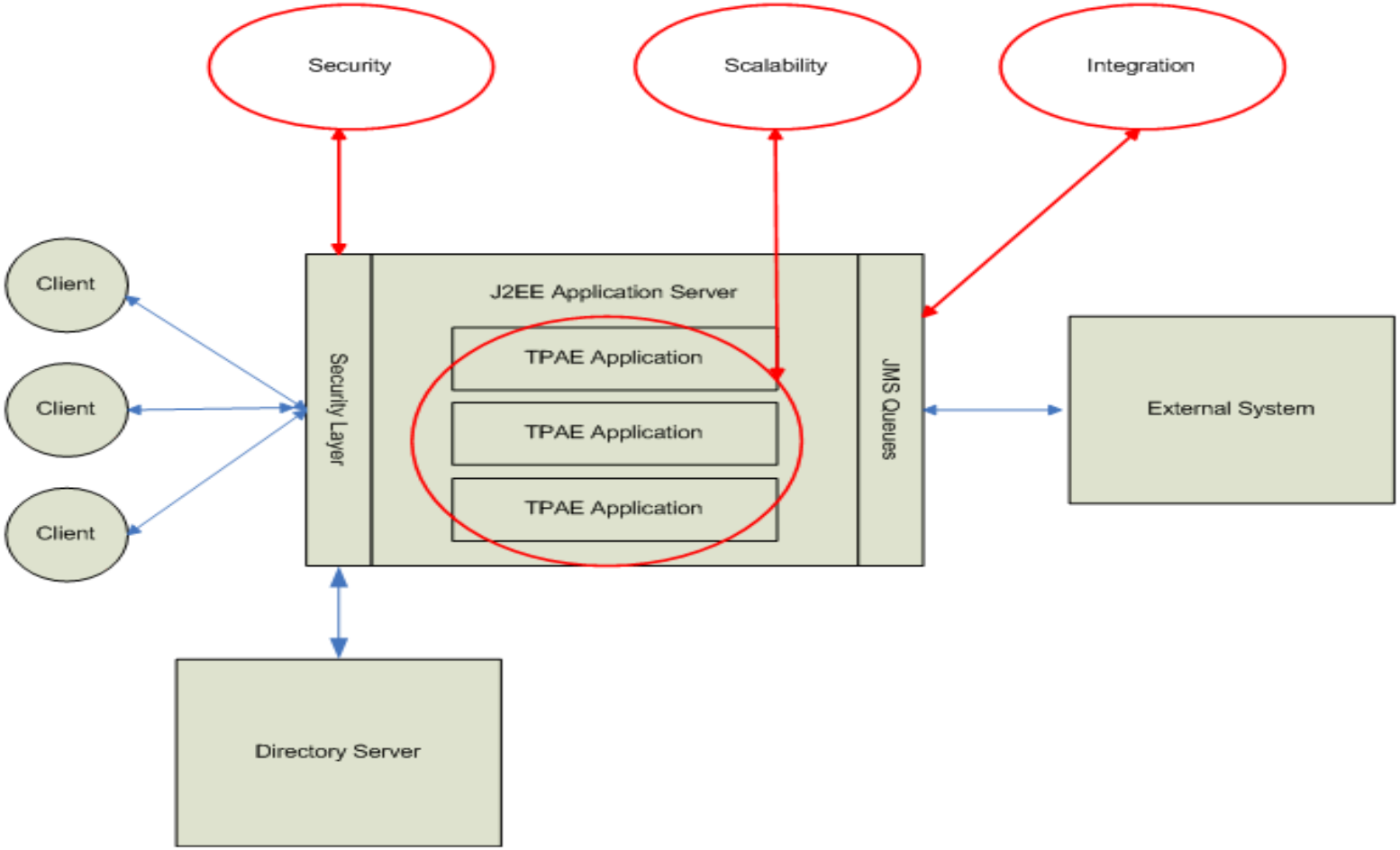
How Does TPAE Use Middleware? (Database)

- **TPAE applications are driven by data**
- **Everything is stored in the database**
  - Configuration Information (Logging, Properties, and Schedules)
  - Security Information (Native, LDAP, and Authorization)
  - Automation Information (Cron Tasks, Escalations, Schedules)
  - Integration Information (JMS config and Integration config)
  - Application Information (Products, Versions, and Fixpacks)
  - Application Data (Client Data)
- **TPAE applications connect to the DB using JDBC and proprietary database connection pooling**

How Does Middleware Enhance TPAE (J2EE)

- **TPAE applications are all inclusive providing**
  - UI, Automation, Reporting, Integration
- **Because a single instance (JVM) is allocated limited resources, load must be managed**
- **J2EE Application Servers provide the capability to manage multiple instances to increase load capability**
- **Through multiple instances, functionality can be isolated into separate instances**
- **Using Directory Servers, J2EE servers can manage security using standard enterprise user repositories**
- **Using JMS queues, data can be interfaced to external systems**

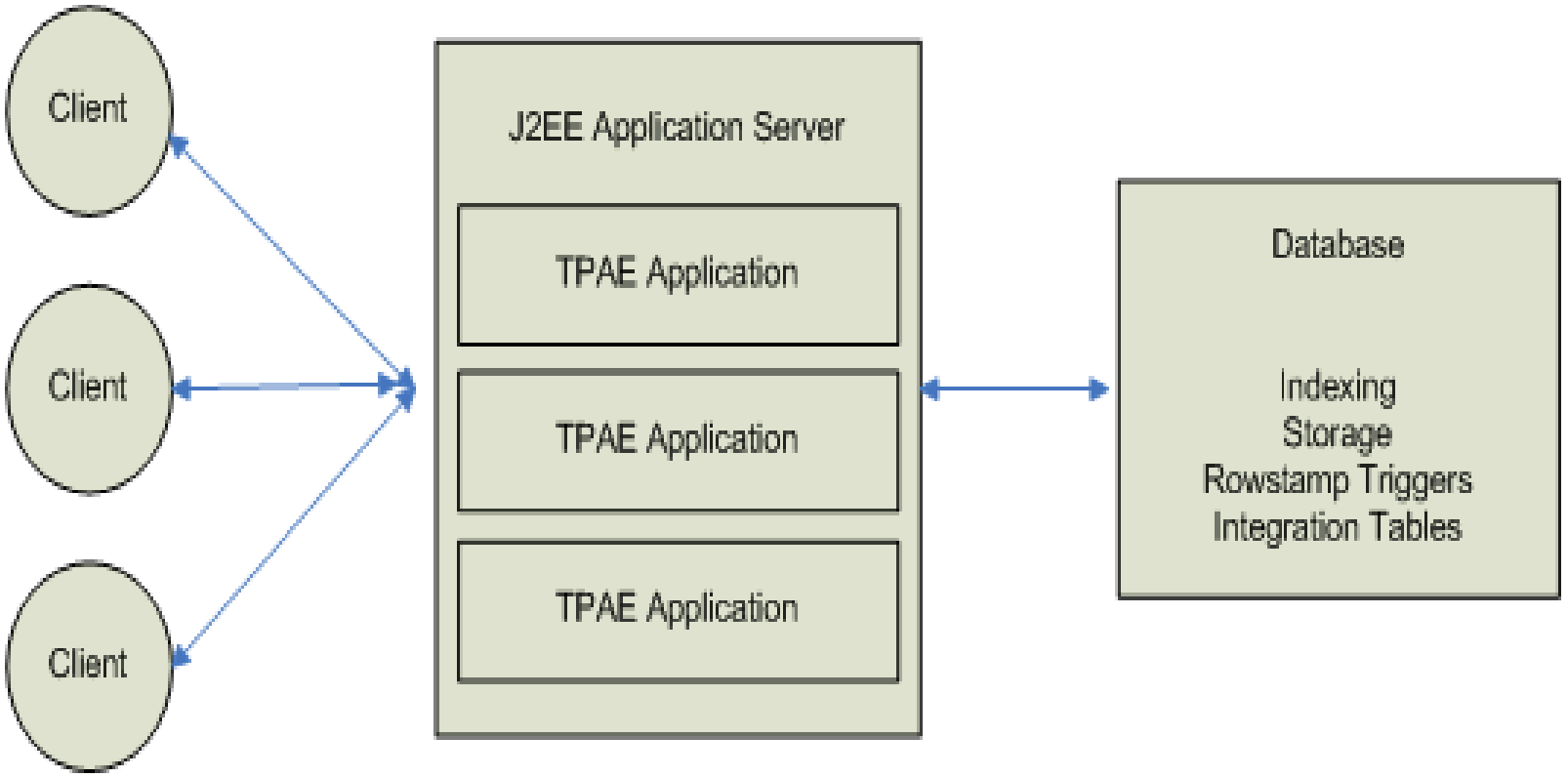
J2EE Middleware Functionality Diagram



How Does Middleware Enhance TPAE (Database)

- **TPAE applications store all information in databases**
- **Metadata stored in the DB facilitates scaling**
  - Server Registration
  - Instance Properties
  - Cache Information
  - User Information
  - Data Definitions and Relationships
- **The database can also be used to architect the integration solution**
- **Database row stamp functions protect against multi user data being compromised**
- **Database indexing functionality provides for fast data searching and prevents duplicate data**

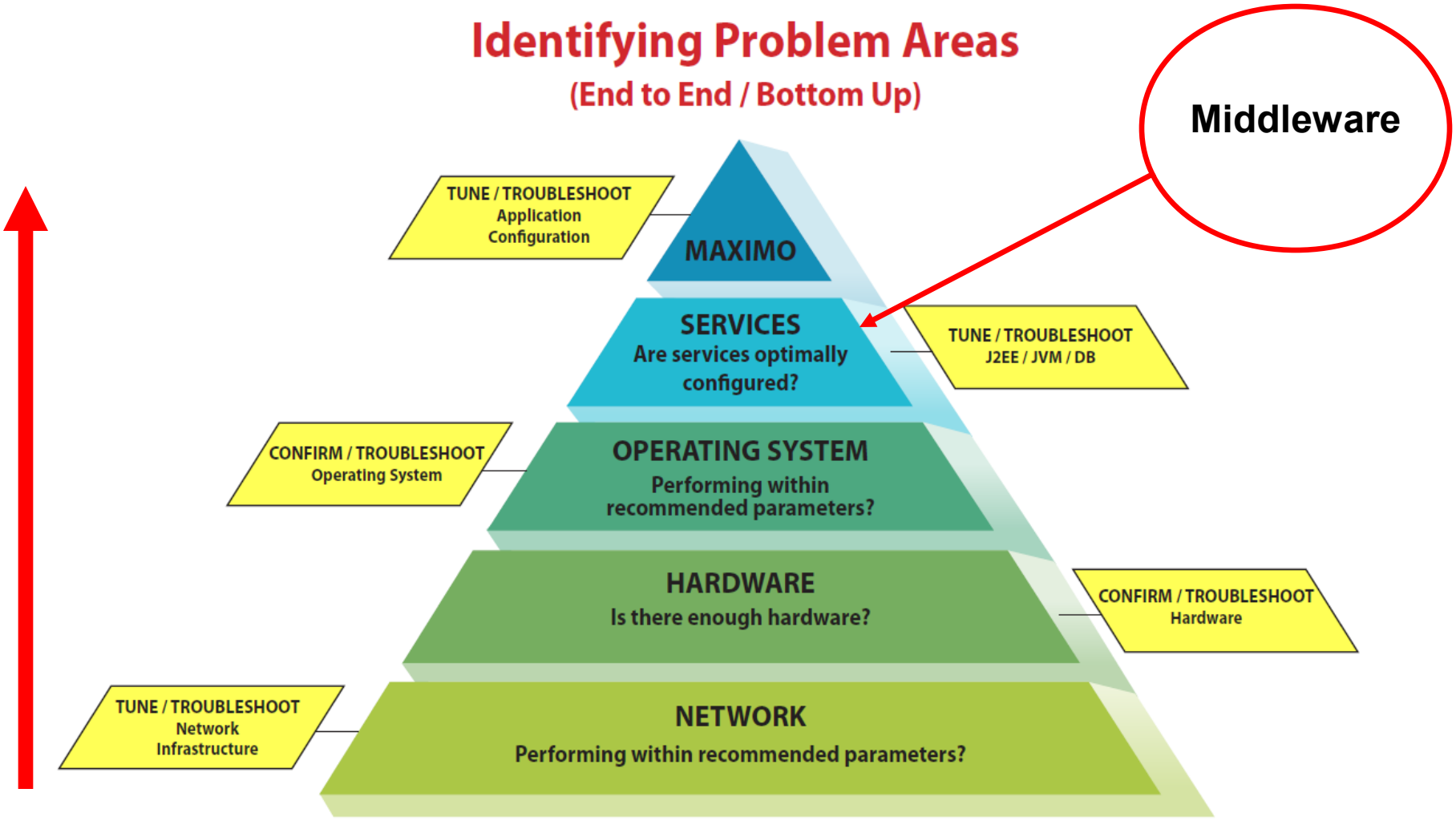
Database Middleware Functionality Diagram



How Does Middleware Impact TPAE

- **TPAE applications are collections of Java coding to deliver functionality**
- **TPAE relies on middleware to provide non functional capabilities**
- **Any technology that TPAE relies on can impact performance and/or stability if it is not optimally configured**

The TPAE Reliance Pyramid



Middleware Impact on TPAE Performance

- **TPAE applications rely on the J2EE server for processing user requests, security, and integration**
- **Proper configuration and tuning of J2EE is critical to TPAE performance and stability**
- **TPAE applications rely on database storage and retrieval for every operation**
- **Proper configuration and tuning of the Database is critical to TPAE performance and stability**

Summary

- **TPAE architecture provides a stable development environment for consuming applications**
- **TPAE architecture relies on J2EE for JVM management, security, and integration**
- **TPAE architecture relies on database technology for storage, integrity, and retrieval of application data**
- **Proper configuration and tuning of the middleware is critical to the performance and stability of the TPAE applications**

Questions