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Building a TCP/IP–Connected GUI and API on Existing IMS Applications at Telcordia Technologies

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Mousing the Mainframe

Building a TCP/IP-connected GUI and API on existing
IMS Applications at Telcordia Technologies

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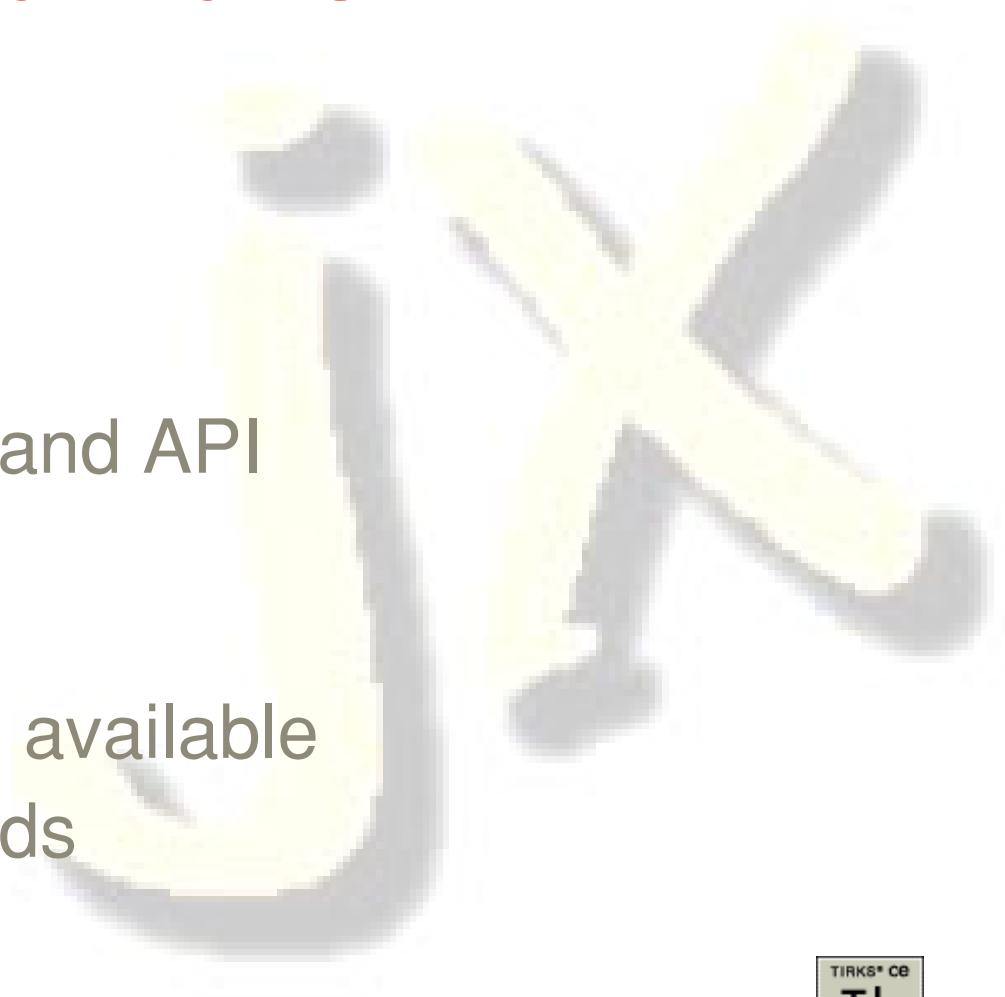
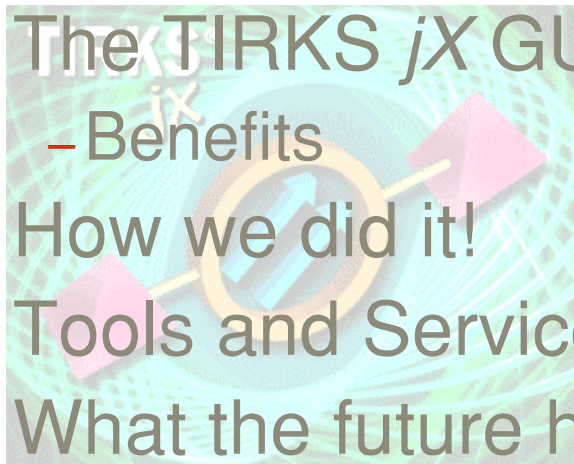


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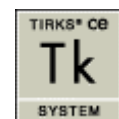
Mousing the Mainframe

- What is ...
 - TIRKS?
 - IMS Connect?
 - jX?
- The TIRKS jX GUI and API
 - Benefits
- How we did it!
- Tools and Services available
- What the future holds



What is TIRKS?

- TIRKS is an integrated inventory, order control, circuit design and provisioning system used by the Regional Bell Operating Companies for flow-through processing
 - Large, Mission-Critical IMS/MVS Application
 - Over 900 screens
 - 1.07 million lines of code (PL/I, Assembler, Java, C, Focus)
 - Minimizes manual interventions
 - Fast response time
 - Handles millions of transactions per day
 - Documented 3.5 million in a single system
 - Documented GT 5 million over 3 Data Sharing partners
 - Also handles equipment and facility planning and reporting
- Installed on 28 z/OS™ processors in the U.S
 - Over 90K users in the US
 - 10k power users
 - 40k casual users
 - 40k screen scrapers
- MSC/ISC Communications



What is IBM IMS Connect?

- IMS Connect provides TCP/IP connectivity for IMS systems.
 - Connects using sockets
 - Communicates with IMS Open Transaction Manager Access (OTMA) interface
 - Runs in its own address space
 - Supports high-performance communications between one or more TCP/IP clients and one or more IMS systems
 - Provides commands to manage that environment and assist workload balancing
 - Reduces design/coding effort for client applications
 - Provides easier e-business access to IMS Apps & data

What is *jX*?

- *jX* is a Telcordia invention that provides a GUI and API Java eXtension of an IMS application.
- The **jX Studio Tool** reads MFS source files and automatically builds Java source code
 - **_screen** – details the screen layout (e.g., field content/positioning)
 - **_map** – details the screen I/O mapping (e.g., I/O areas sent to/from the mainframe)
 - Modifications can be made to mapping to specify the type of GUI widget to be used for fields, etc.
 - **_user** – details user defined screen specific information (e.g., combo box values, tool tip help, transactions related to PF key processing)
 - **_menu** – details the screen menu and toolbar

What is *jX*? *(continued)*

▪ *jX* Core Libraries

- **GUI** – classes defining GUI components (e.g., panel, text field, combo box, etc.)
- **ITOC** – classes defining communication protocol with IMS Connect
- **IO** – classes defining I/O mapping of screen data between the GUI and IMS host
- **Common** – classes defining common functionality used in the application (e.g., keyboard mapping, printing, etc.)
- **API** – classes defining common API functionality

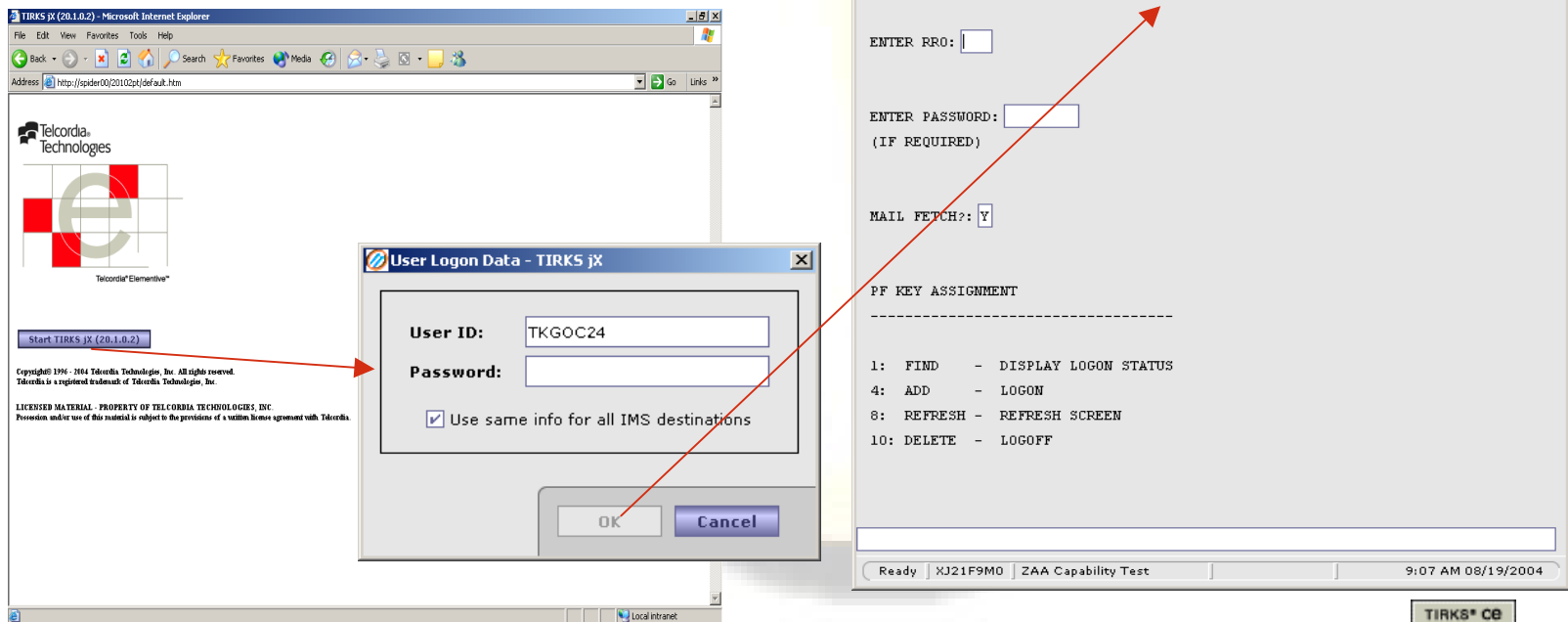
What is *jX*? *(continued)*

- First used in the Telcordia TIRKS CE system
 - *jX* GUI GA March 2002
 - *jX* Java API GA August 2002 (2 tier)
 - *jX* XML API GA May 2003 (3 tier), TIRKS Release 19.9

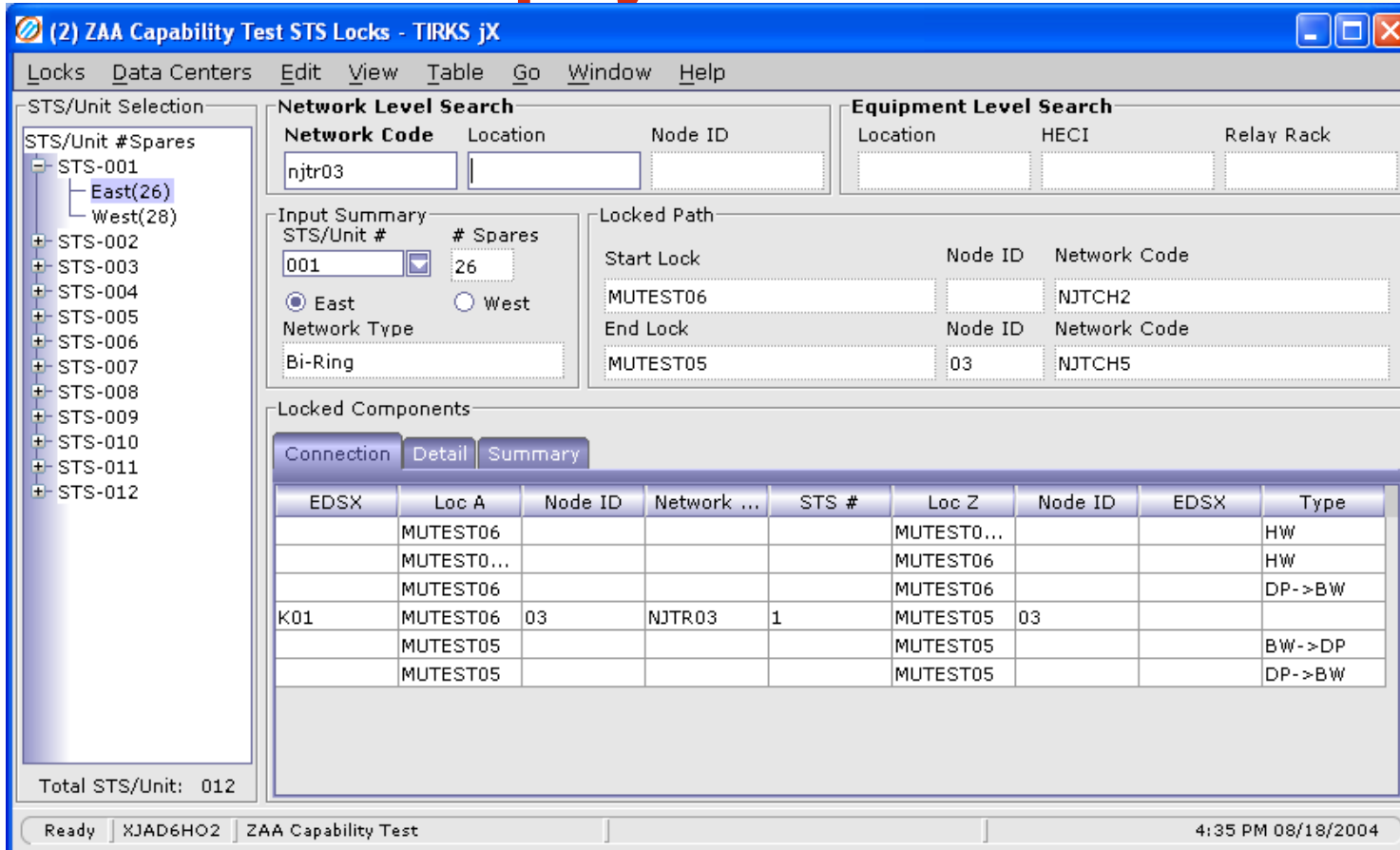


The TIRKS *jX* GUI

- The *jX* GUI is the new TIRKS presentation layer
- It surrounds or supplants the MFS user interface
- It provides a GUI environment to the TIRKS user and developer
 - Capable of building new GUI screens



New TIRKS screen w/GUI functionality: STS Locks Display



STS/Unit Selection

- STS/Unit # Spares
 - STS-001
 - East(26)
 - West(28)
 - STS-002
 - STS-003
 - STS-004
 - STS-005
 - STS-006
 - STS-007
 - STS-008
 - STS-009
 - STS-010
 - STS-011
 - STS-012

Total STS/Unit: 012

Network Level Search

Network Code: njtr03 Location: Node ID:

Equipment Level Search

Location: HECI: Relay Rack:

Input Summary

STS/Unit #: 001 # Spares: 26

East West

Network Type: Bi-Ring

Locked Path

Start Lock	Node ID	Network Code
MUTEST06		NJTCH2
End Lock	Node ID	Network Code
MUTEST05	03	NJTCH5

Locked Components

Connection Detail Summary

EDSX	Loc A	Node ID	Network ...	STS #	Loc Z	Node ID	EDSX	Type
	MUTEST06				MUTEST0...			HW
	MUTEST0...				MUTEST06			HW
	MUTEST06				MUTEST06			DP->BW
K01	MUTEST06	03	NJTR03	1	MUTEST05	03		
	MUTEST05				MUTEST05			BW->DP
	MUTEST05				MUTEST05			DP->BW

Ready | XJAD6HO2 | ZAA Capability Test | 4:35 PM 08/18/2004

Transformed 3270 TIRKS screen: SONP (SONET Path Scan)

(0) ZAA Capability Test SONP - TIRKS jX

TIRKS Data Centers Edit View Go Window Help

SONET A-Z PATH SCAN (SONP) /FOR

COMMAND 08/23/04 15:34:01 PAGE 001

LOC A MUTEST05 LOC Z MUTEST06 ND A ND Z D/C NON/ASGN EXT

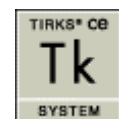
SPARE BW SCID NJTRO3 OC RATE OC12 TOP R PROT 4B ADDTL TRC

BANDWIDTH	TOT	SPARES
TRC	SPR	N/LK LOCK
STS1	21	21 0
VT1.5	77	0 77

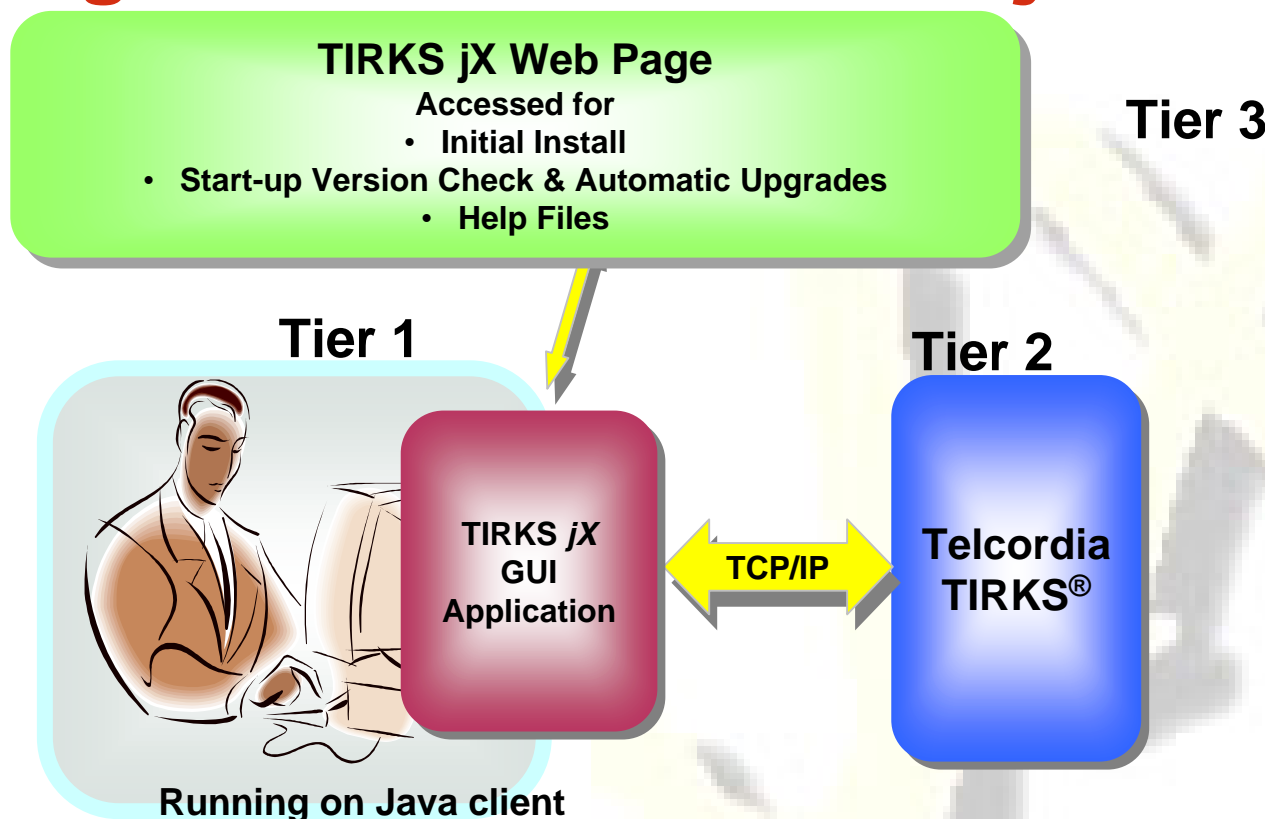
LOC	ND	EQP	CODE	EDSX	RATE	STAT	TOT	SPR	N/SUB	SUBD	N/LK	LOCK	SPR	SPR
A	03	H-POINT												
A	03	SNMSBRA2RA		DS1	PROG IE		84	84	84	0	84	0	0	84
A	03	SNMSPRB2RA		DS3	PROG IE		6	6	6	0	6	0	0	6
A	03	SNMSPRC2RA		STS1	PROG IE		6	6	6	0	6	0	0	6
A	03	M3MPAOT1RA		DS1	GRP IE		84	84	84	0	84	0	0	84
Z	03	H-POINT												
Z	03	SNMSPRB2RA		DS3	PROG IE		3	3	3	0	3	0	0	0
Z	03	SNMSPRB2RA	K01	DS3	PROG IE		2	2	1	1	1	1	0	0
Z	03	SNMSPRC2RA		STS1	PROG IE		6	6	5	1	5	1	0	0

EQP0801 FIND COMPLETED END OF OUTPUT-PF6 NEXT SCID

Ready | XJ1EIHD0 | ZAA Capability Test | 3:34 PM 08/23/2004



High Level View – TIRKS jX GUI



- 2 Tier, direct communication with the mainframe during user session - No server bottleneck

jX GUI Benefits

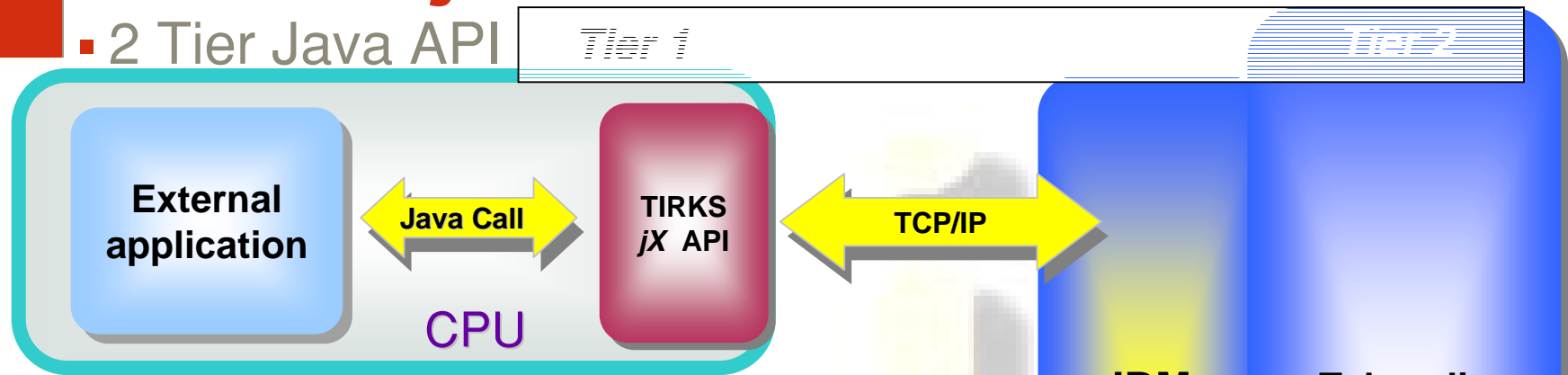
- Meets User Standards
 - Windows® or Browser GUI environment
- Uses existing mainframe Security Access Feature (SAF)
- Simplifies version management and distribution
 - Allows single sign-on
- Provides capabilities not available in 3270 environment
 - Can work with larger amounts of data than a single 3270 screen
- Provides a base for evolving architectures

The TIRKS *jX* API

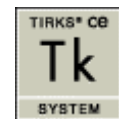
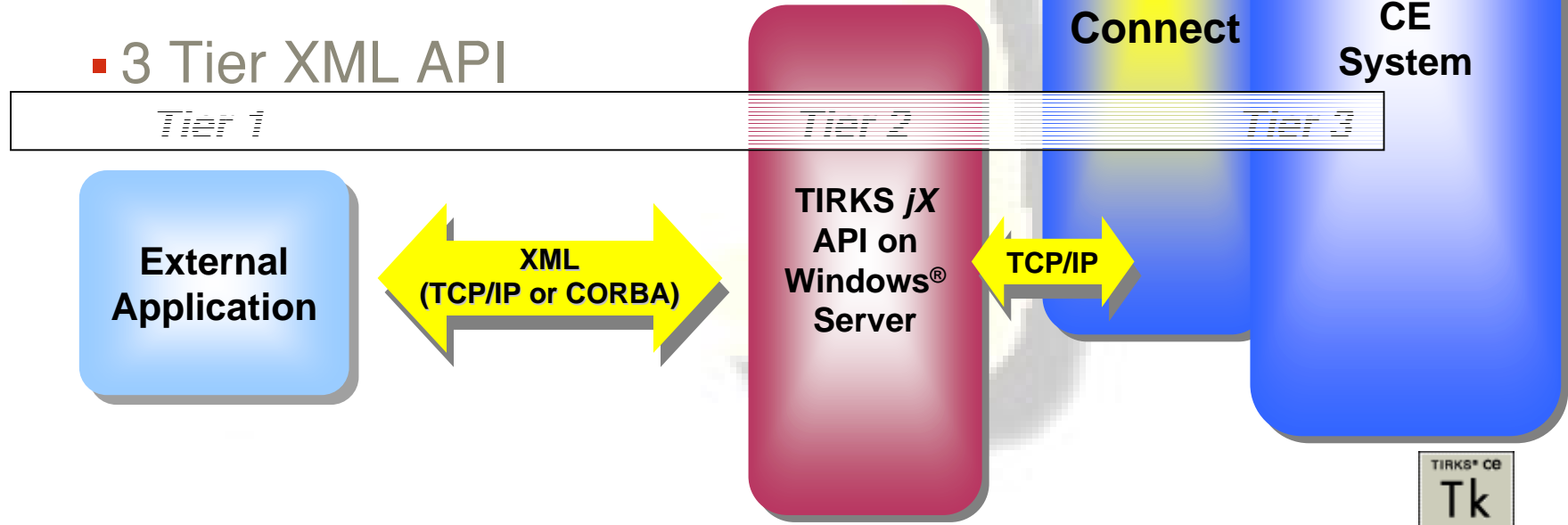
- Allows generic access to the native TIRKS environment (Screen Formats/Fields)
 - Provides the tools to build Business Objects
 - Both 3270 and new *jX* screens
- Both the *jX* GUI & API contain tools that provide the API details (screen and field tag names)
- Data specification and functionality is controlled by the actual TIRKS screen format.
 - Requires detailed knowledge of TIRKS operations to exploit the API fully
- TIRKS functionality is exposed subject to normal SAF and application security
 - Compatible with RACF, ACF-II, etc.

TIRKS jX API

2 Tier Java API



3 Tier XML API



jX API Code Examples

HOW TO INVOKE THE JAVA API (CODE EXAMPLE):

```

session.processScreen("STS Locks");
session.setTextOnField("Network Code (STS Locks)", "NJTR03");
session.processAction("F1");
String nodeValue = session.getTextFromField("Network Type (STS Locks)");
. . .
    
```

Output field value

Find action

Output field name

Window name

Input field name

Input field new value

HOW TO FORMAT API XML MESSAGES

INPUT MESSAGE:

```

<SCREEN>STS Locks</SCREEN>
<FIELD>
  <NAME>Network Code (STS Locks)</NAME>
  <VALUE>NJTR03</VALUE>
</FIELD>
<ACTION>F1</ACTION>
    
```

OUTPUT MESSAGE:

```

<SCREEN>STS Locks</SCREEN>
<FIELD>
  <NAME> Network Type (STS Locks)</NAME>
  <VALUE>Bi-Ring</VALUE>
</FIELD>
<FIELD>
  <NAME> . . . . .
    
```


jX API Benefits

- Meets Industry Standards
 - XML and Java interface to TIRKS
 - TCP/IP or CORBA
 - 2 tier or 3 tier operation
- Simplifies Interface Programming
 - All TIRKS data fields have tag names
 - Field tag lookup and documentation integrated with GUI
 - Enables rapid prototyping
- Compatible with features built using new jX GUI environment
 - No need for terminal emulation-based scripting tools
- Provides a base for evolving architectures
 - Web Services
 - J2EE/JMS Bus / Enterprise Java Beans (EJB)
 - Simplifies integration of new or different transport protocols
- Allows customizable user encryption

How we did it - jX Studio!

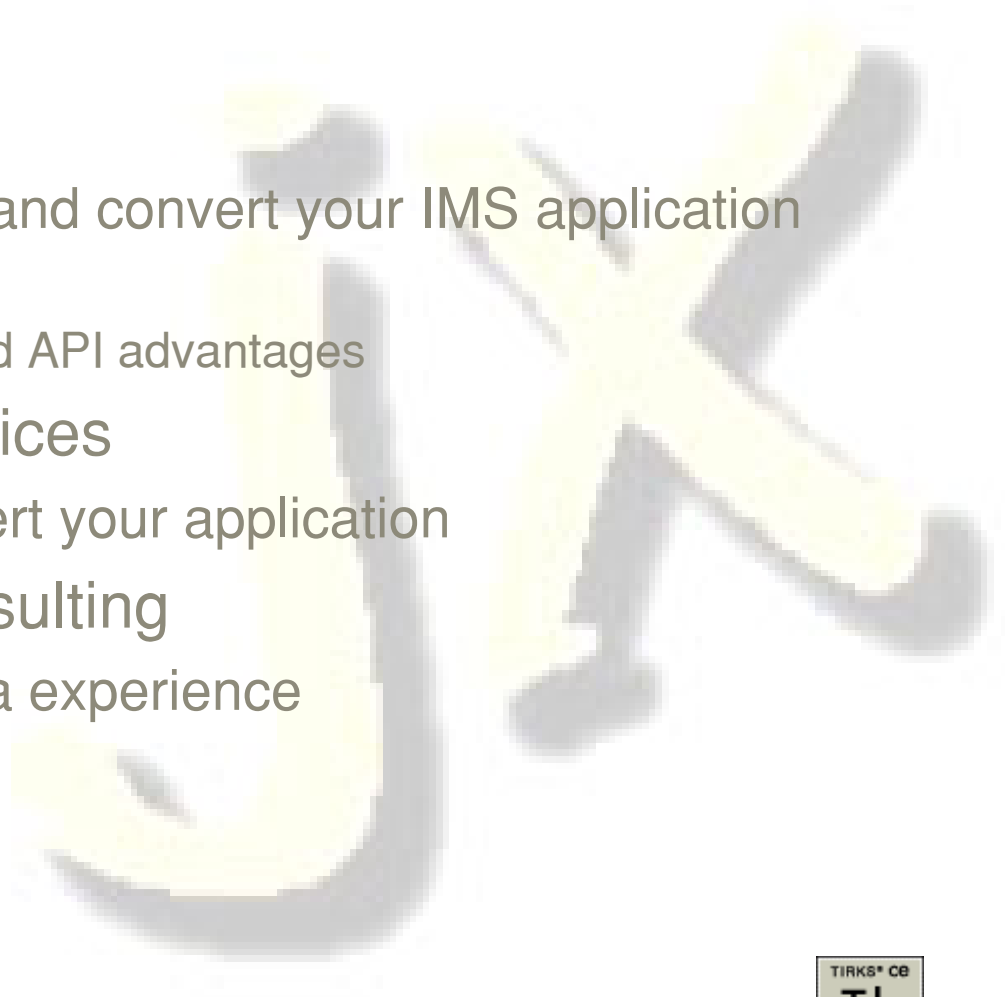
- Rapid conversion of 3270 screens to Java using jX Studio application
- Provides GUI and API
- Scalable
 - Proven on 900+ formats and 4 Telcordia IMS applications
- Robust
 - Handles Alternate PCBs, Logical Paging, Asynchronous Output, MSC/ISC communications, complex message switching, Data Sharing
- Allows integration of HTML-based User Help

How we did it – (continued) jX Studio!

- Flexible
 - Indifferent to implementation language
 - **Requires no changes to core application on mainframe**
- Does **not** require
 - WebSphere®
 - But can be integrated with WebSphere
 - IMS Connector for Java
 - WebSphere Application Developer Integration Edition (WSADIE)
- Extensible to other IMS applications
 - Used in Telcordia TIRKS, ARIS, WFA, and PICS applications

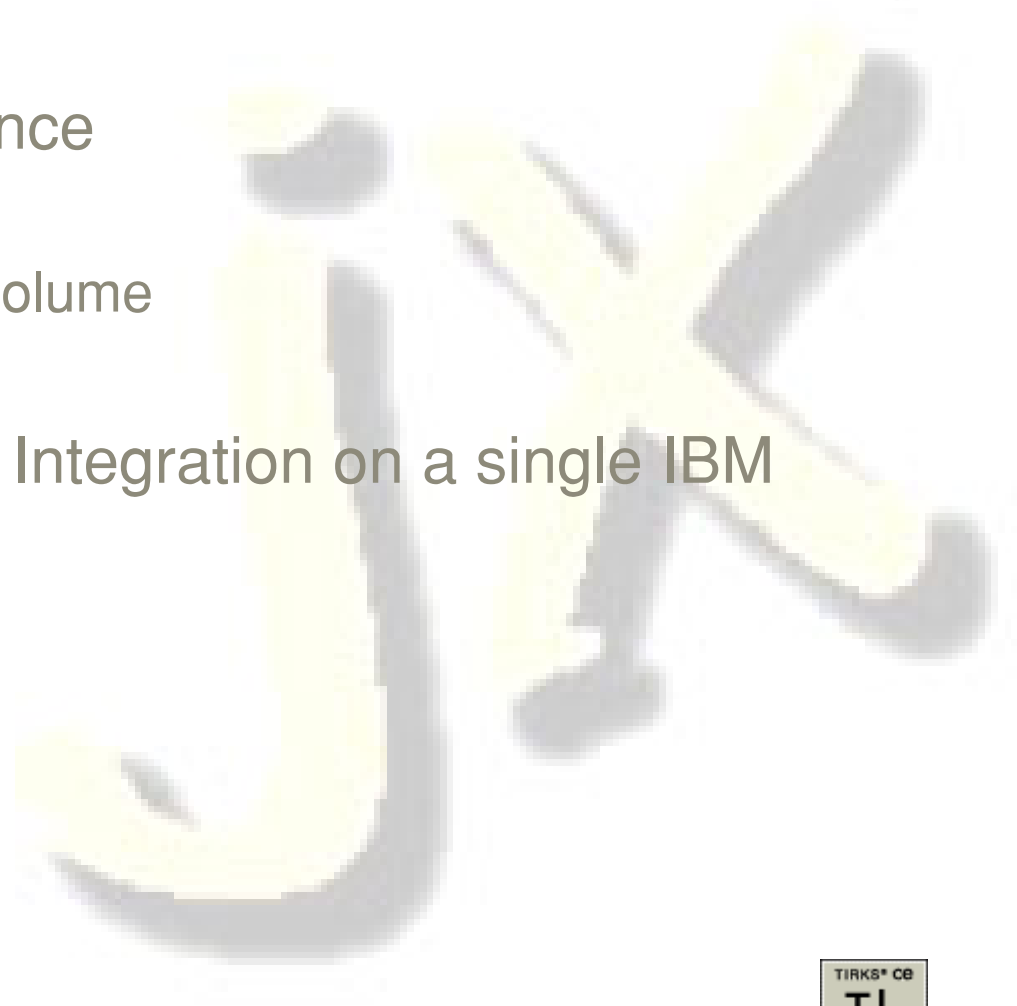
Tools and Services available

- *jX* Studio
 - License the studio and convert your IMS application “green screens”
 - gain the *jX* GUI and API advantages
- *jX* Conversion Services
 - Let Telcordia convert your application
- *jX* Conversion Consulting
 - Gain from Telcordia experience



What the future holds ...

- Mainframe resurgence
 - High Speed
 - High Transaction Volume
 - Superserver
- Workflow and OSS Integration on a single IBM box or Sysplex



For further information

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