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Identity Propagation: ESM Identity and Distributed Identities can Coexist

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Session 10171

WellsFargo facts

SHARE

- 70 M customers
- 9K Stores; 12K ATMs
- 20M Online Banking customers
- 7M mobile customers

- A WellsFargo location within 2 miles of 50% of Americans

- 250K+ MIPS
- CICS daily transaction volume: 625M average, 935M peak

Identity Propagation.. Agenda

- Identity Propagation within z/OS (refresher)
- Identity Propagation from Distributed environments to z/OS
  - Mapping of Distributed Identity to RACF userid
  - Tracking of both RACF Userid + Distributed Identity in SMF
- RACMAP - New RACF command to build mappings
- Mapping algorithm
- Exploiters / Software requirements
- Samples of SMF audit trail
- Summary
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Propagation, not Authentication

- In our context, almost by definition, Propagation refers to copying an Identity
  - *without* authentication
  - accepting an identity from a trusted source / environment
- CICS to CICS connections on same plex, shared RACF db
- CICS to CICS connections on different plexes, different RACF db's
  - Your RACF db's ? Perhaps kept in sync via RRSF ?
  - Or someone else's RACF db such as a business partner
- Similarly for JES NJE
  - RACFVARS &RACLNDE for local trusted nodes
  - NODES: you may trust, you may translate

Distributed Identity

- Distributed Identity characteristics
  - A user identity in the distributed world, in contrast to z/OS UserId
  - Security Registry that was used to authenticate that identity, eg LDAP

Uid=Joe,Ou=Dept,O=company

Registry.Domain

Without Id Prop

User's Identity
• DN & Realm

User's Identity
• RACF userid

z/OS

RACF

SubSystem

Audit

Distributed Application

RunAs

userid

Audit Record
ü RACF userid

Distributed applications often use a common RACF user-ID when invoking CICS, DB2, IMS to process the request. This distributed User ID is not passed to CICS, etc. and on to RACF, making end-user accountability difficult to determine.

Audit records do not show who the user is; accountability difficult to determine who the originating user is.

3 problems / challenges

1. Determination of the z/OS identity is performed outside of z/OS
   - Often within an application
   - Are you really comfortable with that ?
2. Accountability in z/OS audit trail does not reflect end user identity
   - A server ID gives no End to End accountability
   - Identity is not propagated across platform boundary
3. RACF has a limit of 8 characters for Userid
   - Often used as a weakness against RACF

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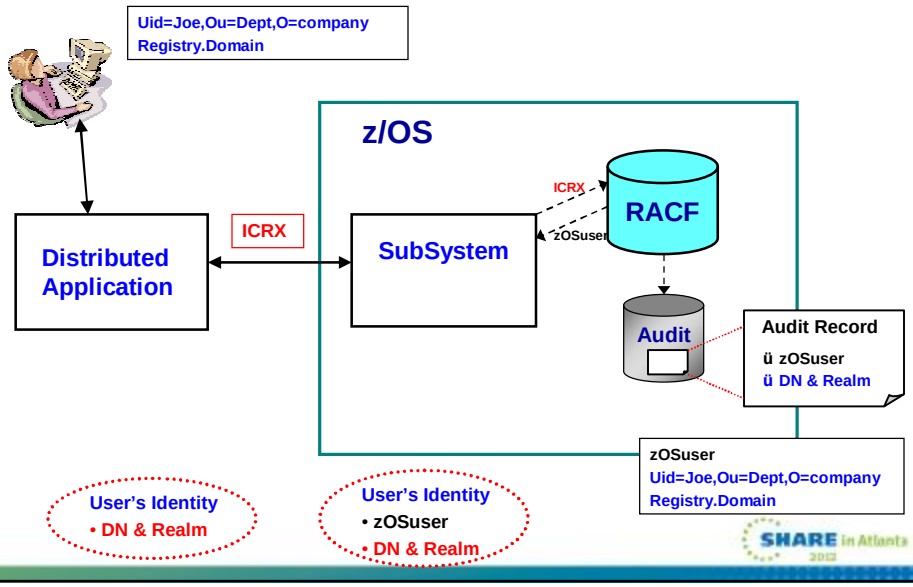
With Identity Propagation



How does RACF do it ?

- New form of RACROUTE VERIFY allows for
  - Distributed Identity + Registry/Realm
    instead of
  - Userid + Password

- RACF searches mappings to find a RACF userid
  - No mapping **è** ICH408I "No mapping found"
  - Match found **è** Build ACEE for RACF userid
    - Also saves Distributed Id + Registry

- SMF record from RACF now includes Distributed Id + Registry (new relocate sections).

Accessing Distributed Identity

- RACF has new relocate sections in SMF records
  - In UTF-8 format
- CICS application can use: EC INQ ASSOCIATION
  - also in UTF-8 format

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Command syntax - RACF

```
RACMAP ID(userid) MAP USERDIDFILTER(name('……..'))
                      REGISTRY(name('……..'))
                      LABEL(xyz)

RACMAP ID(userid) LIST

RACMAP ID(userid) DELMAP LABEL(xyz)

RACMAP QUERY USERDIDFILTER(name('……..'))
             REGISTRY(name('……..'))
```


Security Administration

- RACF Resource access is unaffected. Still controlled via permissions based on Userid / Group(s)

- Mapping of Distributed Identity to RACF Identifier can be
  - One to One — Full match on DN
  - Many "One to One"s — A shared userid
  - Many/Partial to One — A generic z/OS identity

  - DN(*) REALM(*) allows for a catchall
    - "UNKNOWN" / "UNMAPPED" / "Guest"

  - No mapping **è** "Logon violation: Unknown Distributed Identity"

- Mapping filters includes Registry, you decide which authenticators you trust.

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Mapping

- New research class IDIDMAP

- New command RACMAP to define mappings
  - Mapping can be One to One
    - DN + Registry **è** Userid

  - Mapping can be Many to One
    - Partial DN + Registry **è** Userid
    - Algorithm for parsing DN, not a generic mask
    - Allows multiple DN's to map to single userid

  - Can have a "fall through" mapping via "*"

  - Registry can be full name or "*"
    - No partial matchings, Either full or "*"

Mapping algorithm

Iteratively:

- Search for match
- If match found then “Mapping found”
- Remove leftmost RDN
- If end of DN then “No mapping found”
  - RACINIT event qualifier 39
- Try again

Uid=Joe,Ou=Dept,O=company	Registry.Domain	è UserId
Ou=Dept,O=company	Registry.Domain	è DeptId
O=company	Registry.Domain	è CompId

Possible set of mappings

USERDIDFILTER	Userid
Uid=Hayim,Ou=NYRUG,C=RUG	NYRUG
Uid=Stu,Ou=NYRUG,C=RUG	NYRUG
Ou=NYRUG,C=RUG	NYUSER
C=RUG	RUGUSER

Case Sensitivity

RDNname=value,

- RDN *name* *is* *not* sensitive to case
  - **è** RACF upper cases RDN name in db
- RDN *value* *is* sensitive to case

uid=sdodge uiD=sdodge Uid=sdodge UID=sdodge ***Same*** **results.** **Case of RDN name does not matter**	uid=sdodge uiD=sDodge Uid=SDodge UID=SDODGE ***Different*** **results.** **Case of RDN value does matter**

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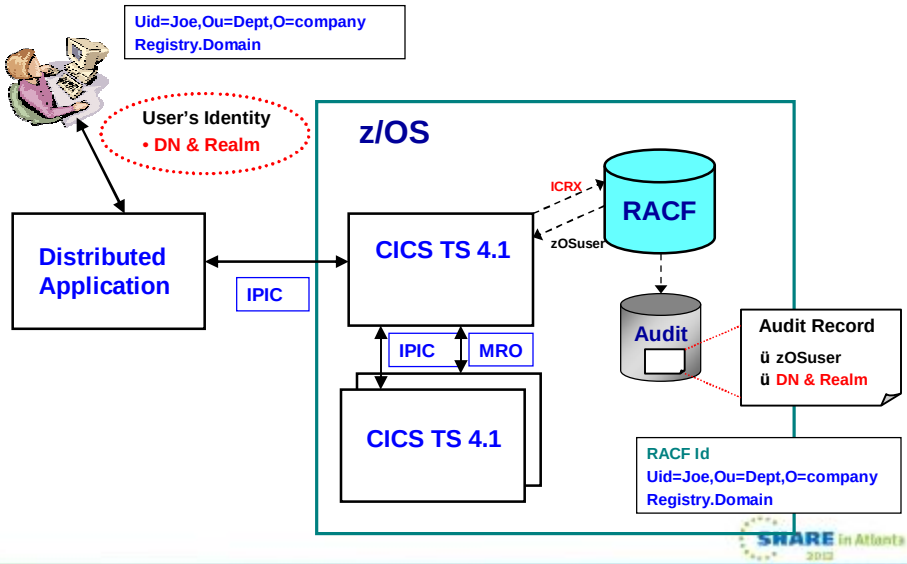
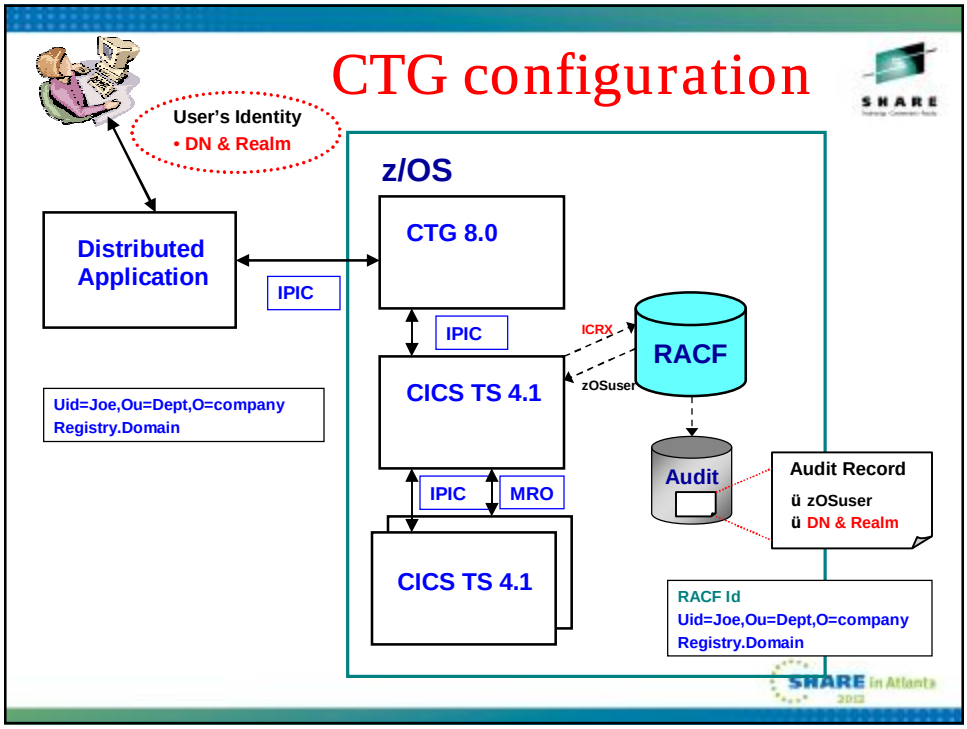
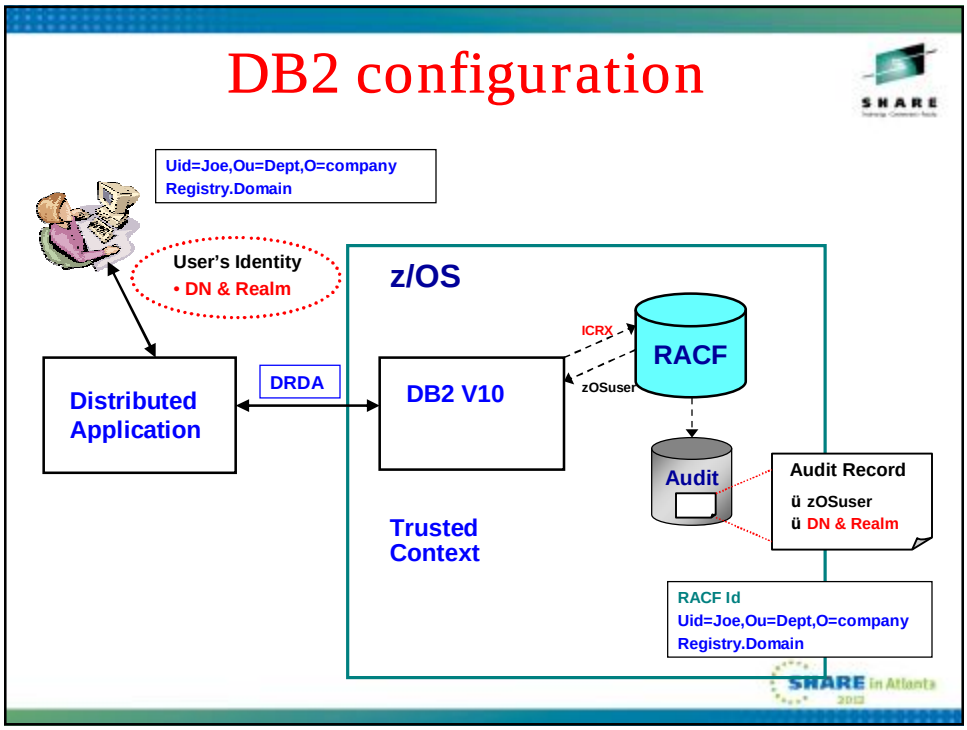
Software support

- z/OS release 1.11 base support
  - PTFs recommended for enhanced support
  - APARs: OA34258, OA34259
- CICS TS 4.1
  - PTFs needed to support Identity Propagation
  - APARs: PK83741, PK95579, PM01622, PK98426
  - Needs IPIC connections
- CICS Transaction Gateway V8
  - Uses IPIC server to CICS
- DB2 V10
  - Needs Trusted Context
- WebSphere Application Server V??

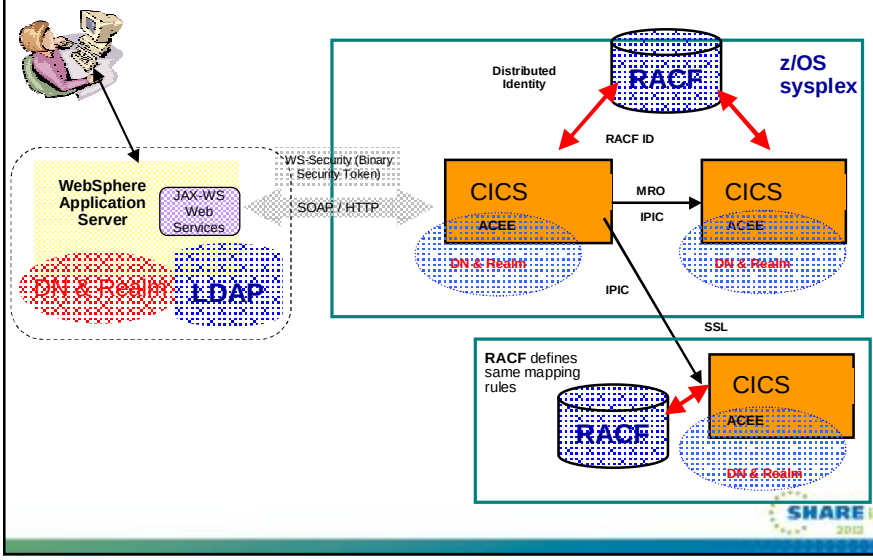
CICS configuration




CTG configuration
User's Identity
• DN & Realm
z/OS
Distributed Application
IPIC
CTG 8.0
IPIC
CICS TS 4.1
ICRX
zOSuser
RACF
Uid=Joe,Ou=Dept,O=company
Registry.Domain
Audit
Audit Record
ü zOSuser
ü DN & Realm
IPIC
MRO
CICS TS 4.1
RACF Id
Uid=Joe,Ou=Dept,O=company
Registry.Domain


DB2 configuration
Uid=Joe,Ou=Dept,O=company
Registry.Domain
User's Identity
• DN & Realm
z/OS
Distributed Application
DRDA
DB2 V10
ICRX
zOSuser
RACF
Audit
Audit Record
ü zOSuser
ü DN & Realm
Trusted Context
RACF Id
Uid=Joe,Ou=Dept,O=company
Registry.Domain

Identity Context Propagation – WebSphere (Web Services)



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Logon failure

```
16.42.52   ICH408I USER(CICS  ) GROUP(STC  ) NAME(STARTED TASK
   008       DISTRIBUTED IDENTITY IS NOT DEFINED:
   008       uid=martina,ou=swg,o=ibm wtsc58.itso.ibm.com:389
16.42.52   IRR012I  VERIFICATION FAILED. USER PROFILE NOT FOUND.
```

```
S M F   R E C O R D   L I S T I N G   19Jan11 11:43 to 19Jan11 18:02

Date       Time     Typ Event    Eq Userid / DistName + Registry
19Jan2011 16:42:52  80 RACINIT  39 CICS
                                   uid=martina,ou=swg,o=ibm
                                   wtsc58.itso.ibm.com:389
```

Event Qualifer 39

Distinquished Name

Registry

Resource access

```
Date       Time     Class    Intent  Tranid Userid / DN + Registry

19Jan2011 17:32:20 TCICSTRN READ    CSMI   SWGRES
                                           UID=MARTINA,OU=SWG,O=IBM
                                           wtsc58.itso.ibm.com:389
```

Mapped Userid

Distinquished Name

Registry

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Does this address our issues ?

- "z/OS ESM's have a limit of 8 char max for userid"
  - Still a limit of 8, but So What ? Now that we have both identifiers, the limit of 8 on z/OS identity seems irrelevant
- "Audit trail on z/OS just reflects RACF identity, not Distributed Identity; No End to End accountability"
  - SMF now has both the DN/Realm as well as z/OS identifier
- Distributed applications decide what identity to "Assert" "RunAs"
  - z/OS Security Administrator controls the mappings to z/OS Identity, not the application.

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Redbooks®

- z/OS Identity Propagation
  - SG247850
- http://www.redbooks.ibm.com/abstracts/sg247850.html?Open
- Examples showing Id Prop for
  - CICS and CTG
  - DB2
  - CICS Web services

Other references

- "CICS and Identity Propagation:
  Solving the End-to-End Security Challenge"
  - Phil Wakelin, Nigel Williams, Martin Brown
  - z/Journal December 2010
  - Mainframezone.com
- CICS SupportPac CH51 for CTG
  - VERY helpful when troubleshooting CICS / CTG connection

The end..

Any Questions ?