Teamcenter Active Workspace Client Explore Phase- Hi-Tech Equipment Major

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Agenda

- AWC 2.2 - Features Adoption

- AWC 2.2 - Features(Search, Embedded Clients & Other Features)

- AWC Search Fulfillment Architecture
  - AWC and Solr Cloud.
  - TC FTS Indexer.

- Focus Areas & Design Considerations
  - Functional Areas.
  - Technical Areas.

Software Stack
Teamcenter 10.1.2.1
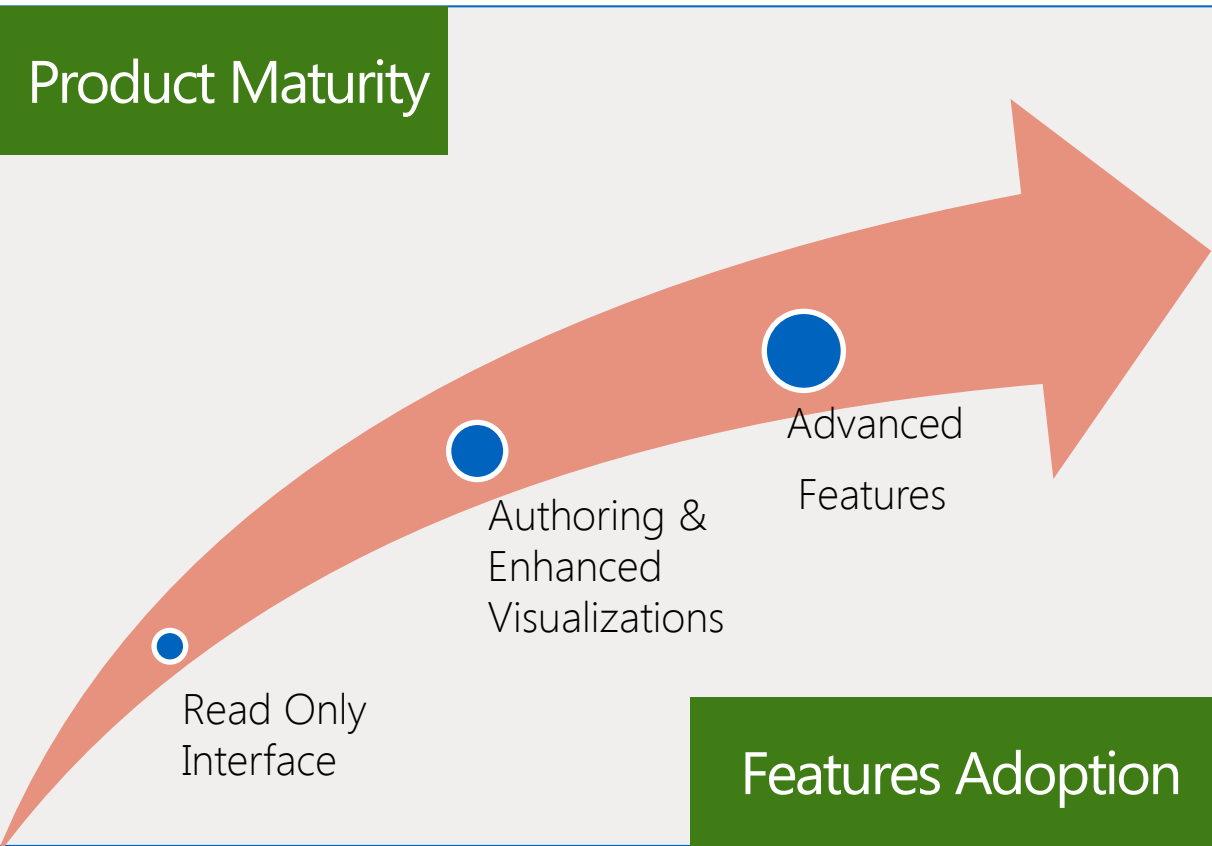NX 9.0.2.5
Active Workspace (AWC)- 2.2

AWC Introduction !!

Do we need yet another one...for this forum

AWC 2.2.x Features – Under Consideration for Adoption

Product Maturity

Features Adoption

- Read Only Interface
- Authoring & Enhanced Visualizations
- Advanced Features

- <u>Read Only interface</u> for Data View and Enhanced UX.

- <u>Fast and Feature rich search</u> for data discovery and consumption.

- <u>Embedded AWC clients for NX & RAC</u> for Consistent UX and Feature delivery for extended Clients.

- <u>Other Classic Modules</u> (Home, Object View, History Views,*Inbox etc…).

- <u>Architecture</u> for the global implementation for relevant features.

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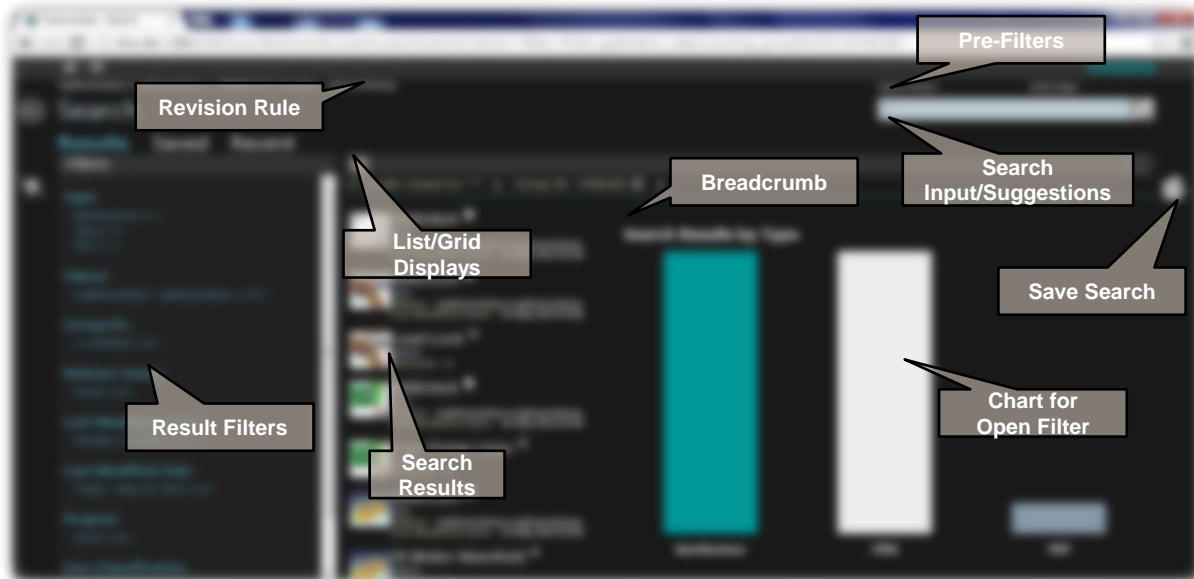# Design For - UserExperience ,Findability ,Scalability & Architecture
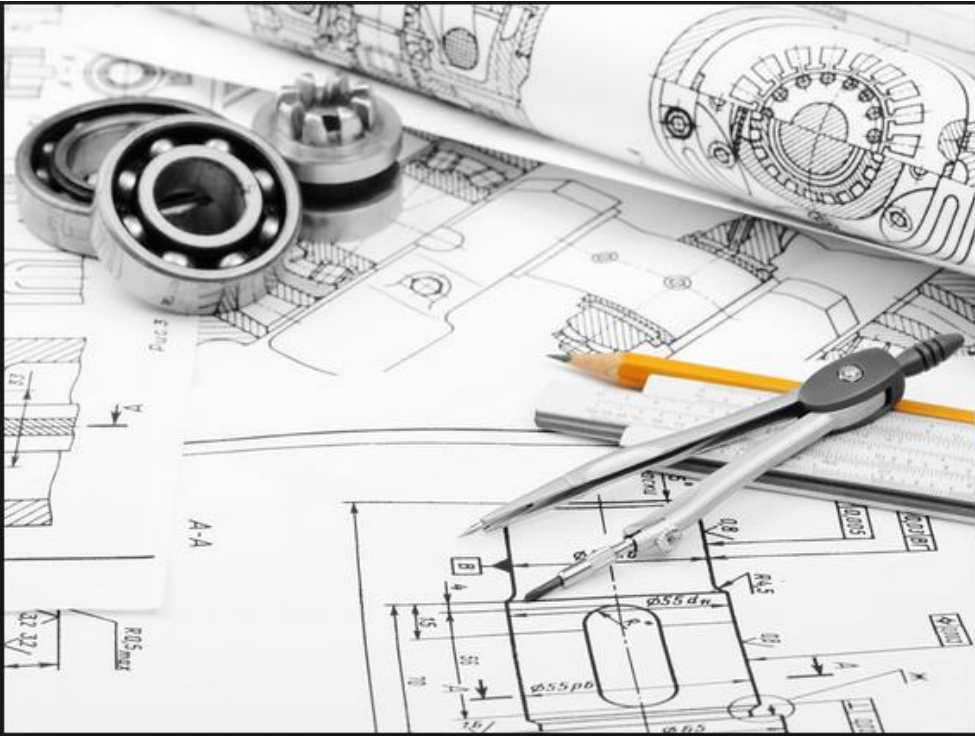
Enhanced UX - Consistent and Simplified UX for various Modules across interfaces and Devices.

Findability - Easy search and discovery of key data for relevant users and usecases.

Scalability- Adoption of relevant and reliable product features across the global implementation landscape.

Architect For-Performance, High Availability &,Security for the implemented modules and future roadmap.

Search – Business Objects

Labels in image: Pre-Filters, Revision Rule, Breadcrumb, Search Input/Suggestions, List/Grid Displays, Save Search, Result Filters, Search Results, Chart for Open Filter

Metadata (Business Objects)

- Business Objects (Items, ECO's)discovery with relevant facets for relevant BU's.
- Classification Search.

File Contents

- Gradual adoption of file content search based on relevant usecases.
- Optical Content Recognition support for AWC indexing engine (See some recent posts regarding TIKA-93 & Tesseract)

Other Future candidates & thoughts

- Enterprise Search – Content Aggregation & Exposing TC data for other enterprise search applications.

BOM Related - Structure Indexing & Search
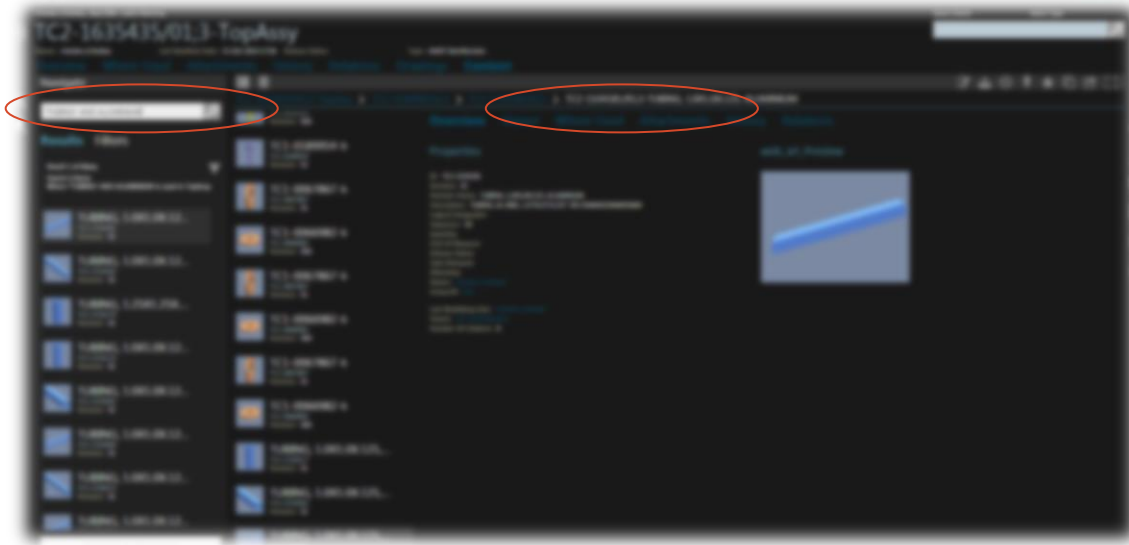
Structure Search (Business Objects)
- Structure navigation and display using breadcrumb, layouts (tiles, table, etc..)
- Find within structure using full text search and filters (Implementation- Solr Driven).
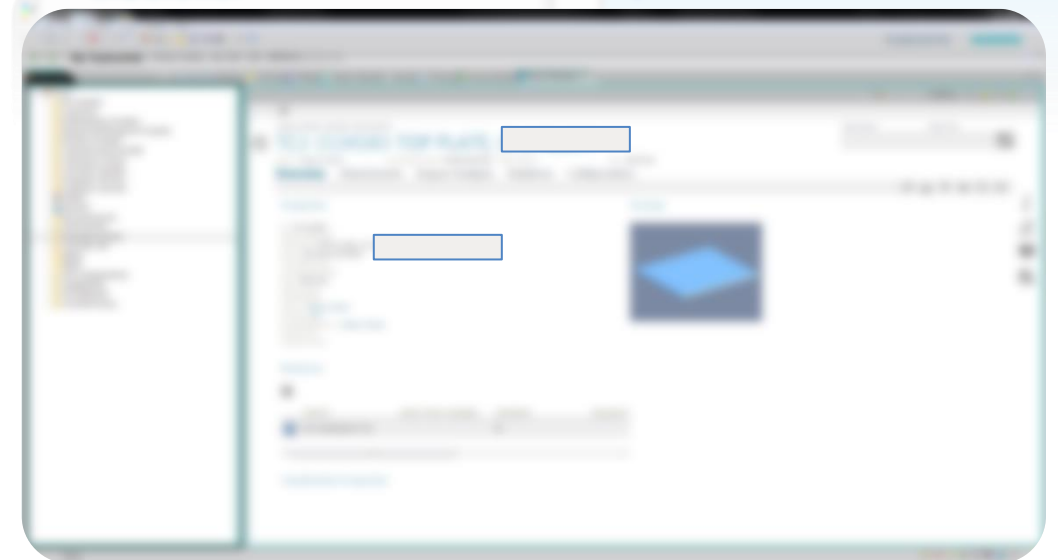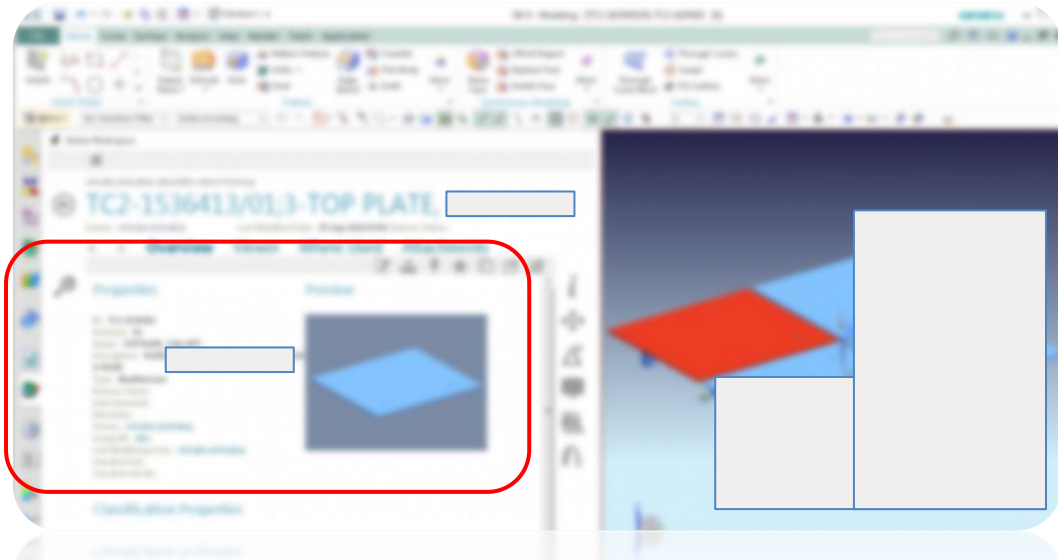
WhereUsed
- Quick Where Used in top level product and End Item depending on the indexed structure(Implementation – TC Core tables).

Powerful Find in Context & Visualization
- Search using the Full Text Search in the context and easily and visually navigate to the elements.

Embedded Clients (NX RAC)

Embedded in NX
- Embedded AWC features for NX are not supported in NX2T mode (unlike 4t).
- Can still launch AWC in NX 2T Browser (no binding to the local TC Server)

Embedded in TCRAC supports 3 views
- Active Workspace Search View :- Quick search in RAC Navigation pane renders results in Static View.

- Active Workspace Follow On view – User co-ordinated actions for RAC selection (need more documentation)

- Active Workspace Inbox view in RAC (Would prefer a Group preference for this)
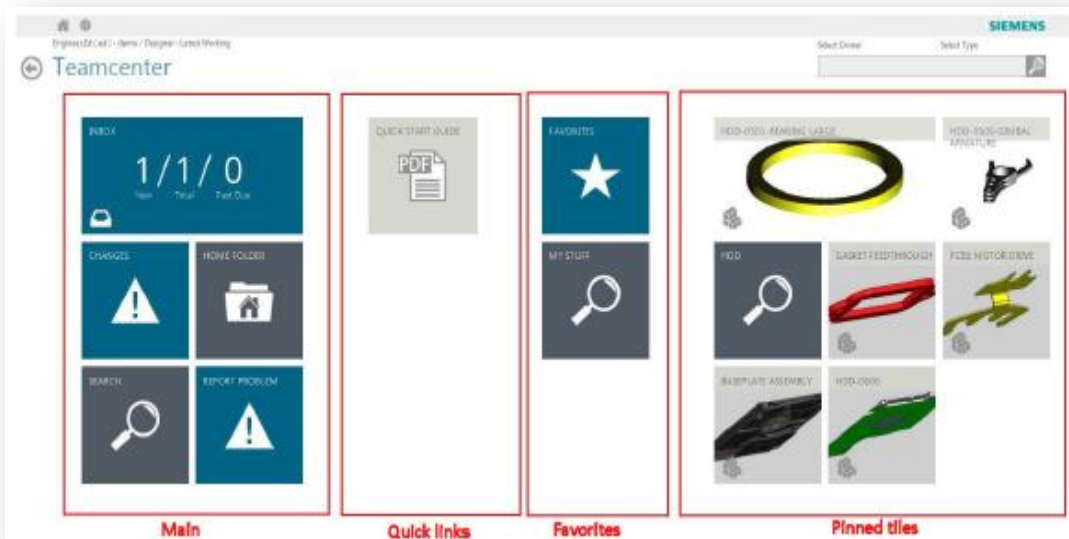
Embedded Clients (NX,TC RAC)

#	Active Workspace Capability/Feature	NX 4T	NX 2T	Tc 2T RAC
1	Active Workspace in NX Resource Bar	Embedded	NX Embedded Browser	Embedded
2	"Open in NX" from AWC	Yes	Yes	Yes
3	"Add Component" to an NX Assembly from AWC	Yes	No	No
4	From NX right click on component to display info in AWC (Overview)	Yes	No	No
5	Select component in NX to highlight Item in AWC (under Tc folder) and vice-versa - Select sub-component in NX graphics area to highlight the Item under Tc Folder in AWC - Select Item under Tc Folder in AWC to highlight the sub-component in NX graphics area	Yes	No	No
6	Additional Tc Web Tier scaling required (vs local 2T resource)	Yes	Yes	No
7	Additional SSO login	Yes	Yes	No
8	AWC within NX (Resource Bar) without switch to Tc client	Yes	Yes	N/A

User Interface Definitions for Various Modules

Configurations & Customizations

- Options to configure Home Page based on Group/Role and User Tiles.

- XML Rendering templates (XRT) /stylesheets used for Layout and presentation of Business Objects (Items, Datasets,Forms,ECX etc..) Various Modules.

- Flexibility to configure using preferences AWC_type_name.RENDERING (Info,Summary,Create,) & Tile Attributes renderings.

- Customizations Guide for basic customizations Published along with AWC 2.2 Release (Custom Themes, Contributing Menus etc..)

AWC Search Fulfillment Architecture – Solr

AWC- Search SolrCloud Architecture/Site

Site 1 Users

Site 1
Enterpirse Tier
Resourse Tier
Translator Process
AWC Search Servers

Main Indexing

Site 1 AWC hosted with :- Indexer, & AWC SOLR Search servers

AWC Search/Indexing To Node 8983 (multiple cores)

AWC Search Servers Configured for SolrCloud mode
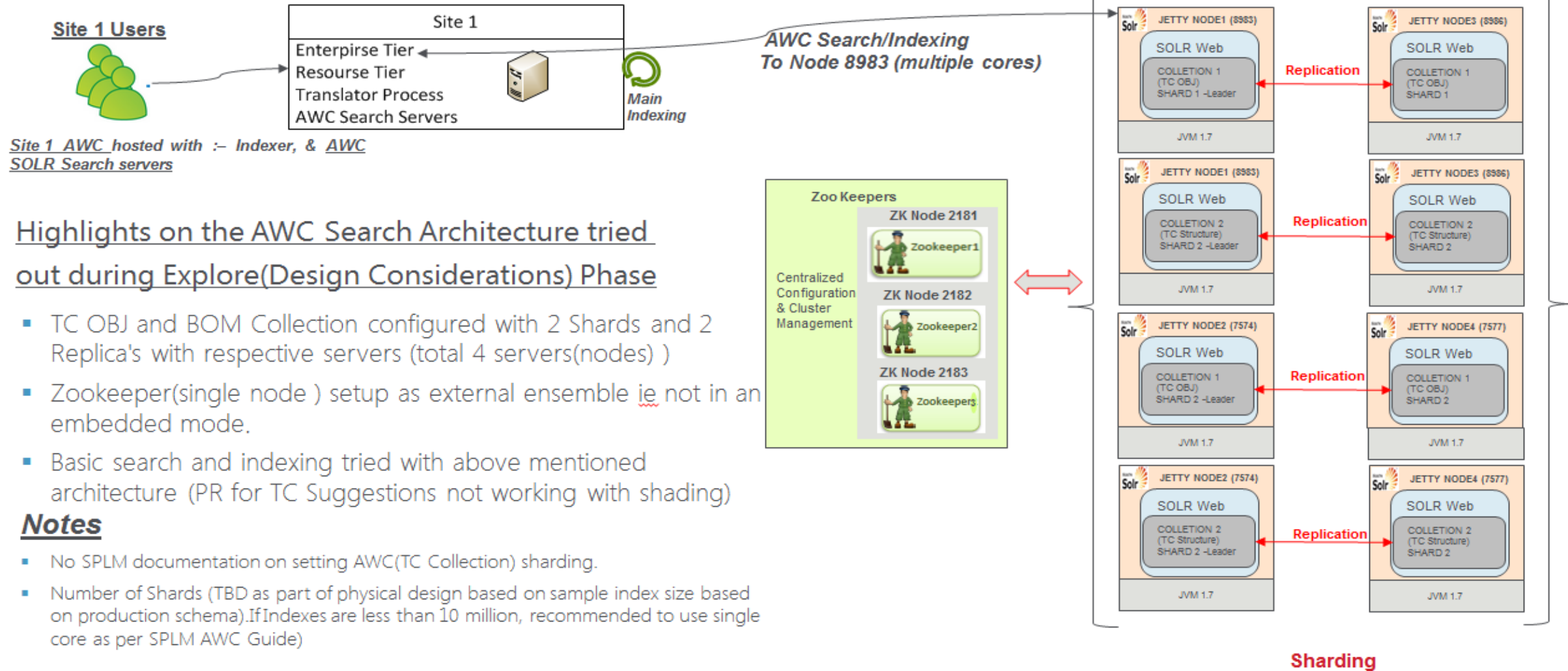
Highlights on the AWC Search Architecture tried out during Explore(Design Considerations) Phase
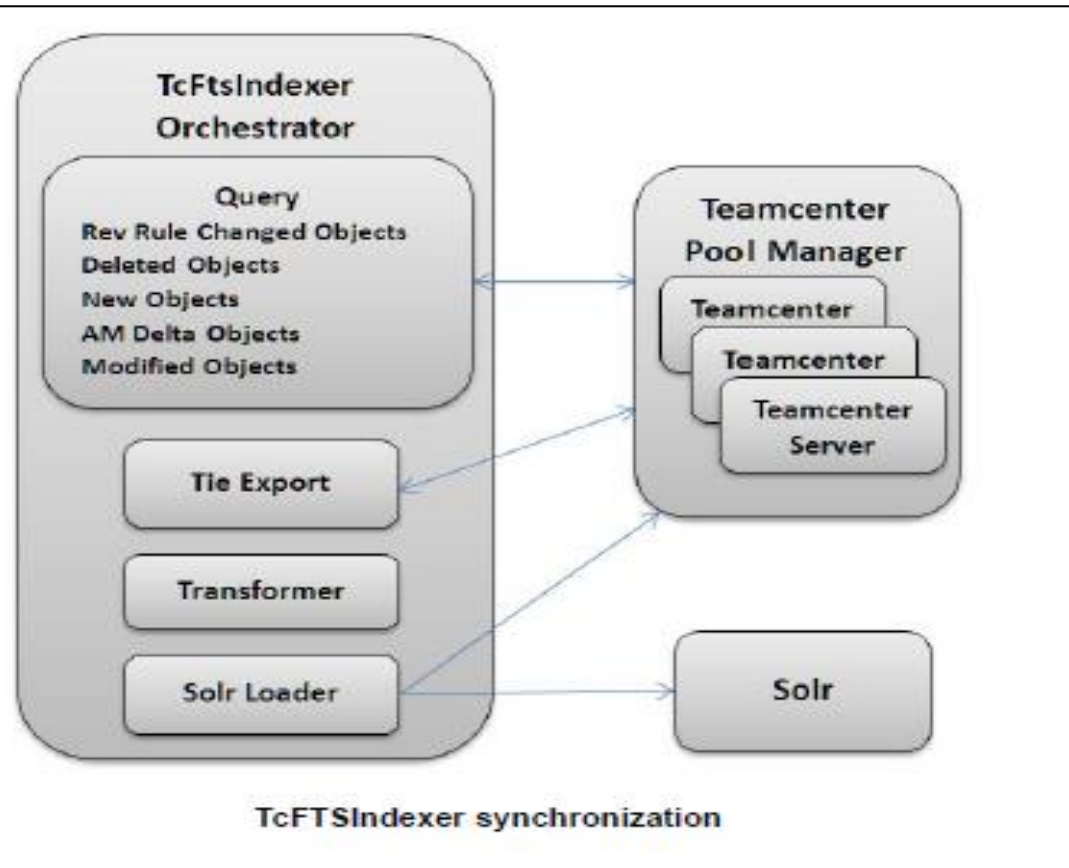
- TC OBJ and BOM Collection configured with 2 Shards and 2 Replica's with respective servers (total 4 servers(nodes))
- Zookeeper(single node) setup as external ensemble ie not in an embedded mode.
- Basic search and indexing tried with above mentioned architecture (PR for TC Suggestions not working with shading)

Notes

- No SPLM documentation on setting AWC(TC Collection) sharding.
- Number of Shards (TBD as part of physical design based on sample index size based on production schema).If Indexes are less than 10 million, recommended to use single core as per SPLM AWC Guide)

Zoo Keepers
ZK Node 2181 — Zookeeper1
ZK Node 2182 — Zookeeper2
ZK Node 2183 — Zookeeper3

Centralized Configuration & Cluster Management

JETTY NODE1 (8983) — SOLR Web — COLLETION 1 (TC OBJ) SHARD 1 -Leader — JVM 1.7
JETTY NODE3 (8986) — SOLR Web — COLLETION 1 (TC OBJ) SHARD 1 — JVM 1.7
Replication

JETTY NODE1 (8983) — SOLR Web — COLLETION 2 (TC Structure) SHARD 2 -Leader — JVM 1.7
JETTY NODE3 (8986) — SOLR Web — COLLETION 2 (TC Structure) SHARD 2 — JVM 1.7
Replication

JETTY NODE2 (7574) — SOLR Web — COLLETION 1 (TC OBJ) SHARD 2 -Leader — JVM 1.7
JETTY NODE4 (7577) — SOLR Web — COLLETION 1 (TC OBJ) SHARD 2 — JVM 1.7
Replication

JETTY NODE2 (7574) — SOLR Web — COLLETION 2 (TC Structure) SHARD 2 -Leader — JVM 1.7
JETTY NODE4 (7577) — SOLR Web — COLLETION 2 (TC Structure) SHARD 2 — JVM 1.7
Replication

Sharding

AWC Search Fulfillment Architecture – Indexing

TcFts Indexer

TcFtsIndexer synchronization

- 4T Client application can be run on Standalone Mode or with Dispatcher framework

- Customization framework published – Useful for Arriving at Granular indexing methodologies.

- Business Objects and Structure indexing support Via TIE(LL) export and corresponding SOLR xml Transform, create and commits. No Solr atomic commits Implemented.

- Need further discovery on finite cases on (a)"What all Changes call for Re-Indexing" (Eg:- Change in AM Rule Tree, Or Adding a Filter for already Indexed Data... But no data Change). (b) Security Related- ACL clauses and Data Search

Focus Areas for AWC Implementation – Functional Areas

Adoption Methodology
- AWC Releases for AWC Modules- Phased approach.
- Features validation for Usability & Scalability.
- Focused BU/Use Cases

AWC – Key Modules & Features (2.1 -2.2)
- Search
- BaseModules (Home, Inbox etc..)

AWC Clients
- Embedded(NX,TC 2T RAC..)
- Browsers (HTML5)
- Mobile Devices

Usability & User Interface Definitions
- Business Objects ,GUI –Interface definitions.
- Simplicity, Uncluttered GUI definitions for Information, Actions & Findability

Search Definitions
- Business Objects, Attributes definitions
- Search Features definitions (filters etc..)
- Search Modules (FTS ,Classification etc..)

User Training
- Usage Specific.
- Supported features and functions.

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Focus Areas for AWC Implementation – Technical Areas

TC & AWC Architecture
- Architecture in Multisite
- Enterprise Servers (HA,Scale,Perf,LB)
- License consumption & SSO modes.

Indexing Methodology
- BU ,Data ,& Site driven
- Legacy & Ongoing data
- Frequency, Data and Multisite locations
- Granular configs for create & updates
- Traceability-Data & Resources .

Testing
- Supported Features
- Data Integrity

Search & Indexing Architecture
- SOLR servers Search and Indexing Arch. (HA,Scale,Perf,LB)
- Scale Up-Down for Indexing legacy and ongoing data
- Dispatcher Servers

Visualization Architecture
- Server Farms & GPU support
- Optional feature-site based

Configurations & Customizations
- GUI & Features – configurations
- Customizations(future)

Credits and Material References

- Rajesh Dwarakanath – TCS (NX AWC related).

- SPLM AWC 2.2 Product Guides.
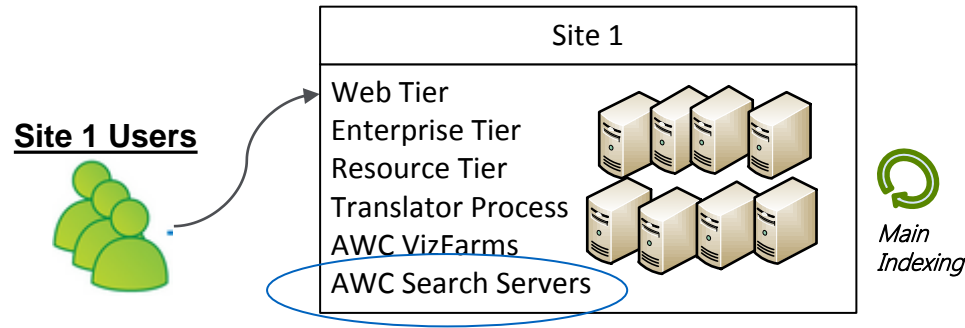- Apache SOLR Product Documentation.

Q&A

Thank You
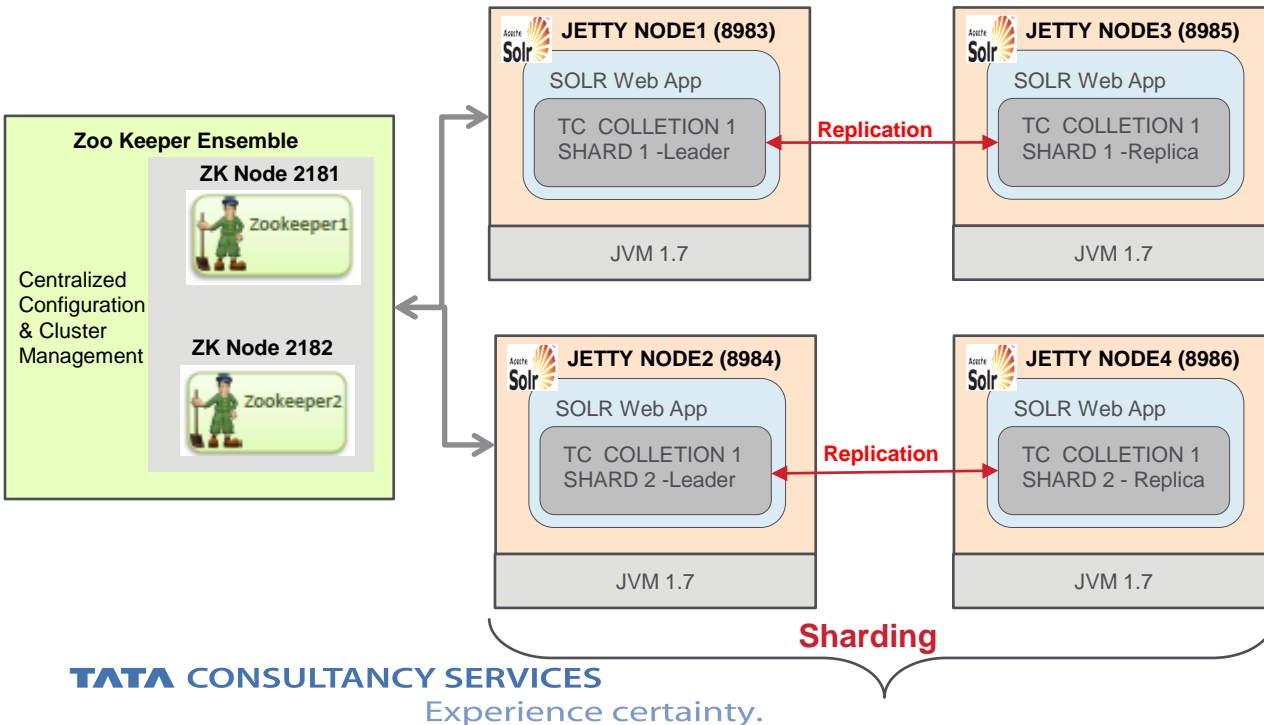
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AWC Search Fulfillment Architecture – Solr

AWC - Solr Cloud

AWC hosted per Site :– Indexers & AWC SOLR Search servers

AWC Search Servers Configured for SolrCloud mode

- Solr Cloud-Subset of optional features in SOLR to enable horizontal scaling.

- Goals of Solr Cloud - Scalability, Performance, High-Availability & Simplicity.

- AWC 2.1 Onwards ships with Solr 4.4 which Supports Solr Cloud. OOTB AWC Solr is Configured as non cloud mode and on Jetty as the servlet engine.

- AWC 2.2 uses 2 Collections(Objdata & BOM) Yet to configure and check the Cloud configuration with AWC Multiple collections, Shown here is single collection (Objdata with 2 shards and 2 Replicas)