SSA, ClusterStor Call-home Service Actions, and an Introduction to the Cray Central Telemetry and Triage Services (C2TS)

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Overview

● **Target Audience**
  - System Owners, Architects, Analysts, Administrators, and Operators

● **Touch on the Benefit of Cray’s Call-home Platform**
  - Improve customer system availability through proactive support
  - Lower customer and Cray operational costs through support process automation

● **Outline**
  - Provide a Cray SSA operational update
  - Provide a brief history of Cray ClusterStor and SSA Integration
  - Describe and define ClusterStor Reliability, Availability, and Serviceability (RAS) telemetry types
  - Preview Cray Call-home Service Action Features for ClusterStor
  - Discuss Support Data Capture on ClusterStor, future use of SSA
  - Preview Next Generation Call-home Architecture: Cray Central Telemetry and Triage Services (C2TS)

● **Summary**

● **Q&A**
Cray SSA Operational Update

- Call-home production use started June 2015
- Active at 21 customer sites, 78 systems reporting
- Processed ~ 80K call-home snapshots, 48K product health events
- Logged 414 proactive and triage case association events
- Field Notice (FN) 6122 contains client release details
Brief History: ClusterStor and SSA Integration

- SSA was qualified for Sonexion in September 2016
- In June 2017, SSA became the official RAS call-home transport on Sonexion
- Cray acquired the ClusterStor Product in 2017
- In March 2018, the first unified SSA Client released for Sonexion and ClusterStor
- Cray recommends all ClusterStor and Sonexion customers use SSA for call-home enablement
ClusterStor RAS Telemetry Types

● Interesting Event Messages (IEMs)
  ● Structured, highly contextual diagnostic events
  ● Cover a broad range of topics
    ● Lustre, disk and enclosure services, systems management, …

● Service Event Messages (SEMs)
  ● Signal when ‘service is needed’, clear when service is completed
  ● Generated through analysis of IEMs and related context
  ● Translate to service event e-mails and alerts local to product

● Machine Reportable Product Data (MRPD)
  ● Infrequent (daily) snapshots of system inventory, status, and, diagnostic information
ClusterStor Standalone RAS Rules Engine

● **Overview**

  ● Analyzes stream of RAS telemetry events
  ● Orchestrates Response Actions
    ● (internal) Updates rule engine state and context
    ● Creates SEMs and thus local service alerts
Disk drive failure under evaluation

Disk drive failure confirmed, context added
ClusterStor RAS Call-home

ClusterStor RAS Standalone
- ClusterStor IEM Producers
  - ClusterStor RAS Rule Engine State
    - RAS Rules
      - SSA Secure Transport
        - IEMs
        - SEMs
      - ClusterStor RAS Rules Engine
      - RAS Rules

ClusterStor RAS Call-Home
- SSA Back-end APIs
  - Cray Service Actions
    - SSA Secure Transport
      - IEMs
      - SEMs
      - ClusterStor RAS Rules Engine
        - RAS Rules
      - RAS Rule Engine State
        - SSA Secure Transport
          - ClusterStor RAS Rules Engine
            - RAS Rules
            - Cray Service Orchestration (automation)
ClusterStor Call-home Service Actions

● Automated Field Replaceable Unit (FRU) Repair Part Orders
  ● On FRU Failure, create and populate a service case, create a corresponding repair part request, and ship part to the customer

● Proactive Service Recommendations
  ● Utilizes up-to-date knowledge of product releases and defects
  ● Rules can be vetted via call-home, updated in future standalone engine updates
  ● Types of recommendations Cray is investigating
    ● ‘you might want to upgrade’ or ‘the following issues exist for your release…’
    ● Faster/better detection for subtle or complex product failures
      ● For example, excessive errors on a data path, possible enclosure failures
ClusterStor Support Data Capture

- **ClusterStor currently has a Support Bundle Feature**
  - Collects system status, logs, ...
  - Data used by support and product teams for root cause analysis of Cray internal and customer issues

- **SSA currently supports ‘triage’ snapshots**
  - Goal is very similar to that of Support Bundle

- **Plan is to reach feature parity in SSA, deprecate Support Bundle over time**
  - Provides streamlined tooling, improved test, and standard interfaces across Cray Products
  - SSA triage snapshots are integrated into Cray customer service systems
Next Generation Call-home Architecture

- Cray Central Telemetry and Triage Services (C2TS)
  - Evolution of Cray’s Call-home platform
  - Design informed from lessons learned after five years of experience with SSA
  - Requirements driven by
    - Parity-or-better SSA features
    - Cray’s next generation supercomputing platform
    - Better alignment with ClusterStor, ClusterStor RAS
SSA’s Relationship to C2TS

● C2TS new ‘back-end’ for SSA and future call-home services
● Major usability enhancements in C2TS for SSA
● Adds cleaner delineation between data lake and applications
  ● Embraces the concept of other application stacks leveraging call-home data lake services
C2TS Motivations

- **Availability**
  - Cray supports customers 24x7x365

- **Scalability**
  - Number of systems, data size and data volume increasing
  - Time to solution requirements decreasing

- **Usability**
  - Cray product support and engineering teams, need to focus on data, not tooling
  - Streaming data is better processing model for some use cases
  - Get more call-home data in front of customers, versus behind-the-curtain

- **Programmability**
  - Less esoteric APIs, data schemas

- **Serviceability**
  - Easy to diagnose, fix issues, understand behavior
C2TS Reference Architecture

Cray: Central Telemetry and Triage Services (C2TS)

- Ingest
- Storage
- UI/UX
- Batch / Snapshot Data
- “ETL”

C2TS: Applications

- Advanced Analytics (CEP/ML/AI)
- Product Engineering and Quality
- Proactive Customer Service And Support Automation

CrayPort

- System Dashboard
  - Inventory
  - Alerts
  - Contextual Recommendations
- Support Cases
  - Software Download
  - Knowledge Base
  - ...

Cray Platform

- Support Data
- Inventory & Config
- Interesting Events
- Service Events
- Product UI/UX

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Summary

- Cray ClusterStor is designed to enable proactive and automated product support via call-home telemetry

- SSA provides a secure call-home transport and a product support automation capability across Cray platforms

- Cray plans to streamline support data collection on ClusterStor, using SSA

- C2TS is Cray’s next generation call-home platform, designed with Cray’s next generation system platforms in mind and lessons learned from five years of experience operating SSA
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Q&A

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