The API Sprint

Presenters:
Gray Taylor, Conexxus
David Ezell, Conexxus
Agenda

• Housekeeping
• Presenters
• About Conexxus
• The “API Sprint”
• Q & A
Housekeeping

This webinar is being recorded and will be made available in approximately 7 days.

- YouTube (youtube.com/conexxusonline)
- Website Link (conexxus.org)

Slide Deck
- Survey Link – Presentation provided at end

Participants
- Ask questions via webinar interface
- Please, no vendor specific questions
- Our webinars may be used toward PCI continuing education credits. Please contact arussell@conexxus.org for questions regarding a certificate of webinar attendance.

Email: info@conexxus.org
Presenters

Conexxus Host
Allie Russell
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Conexxus
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Speakers
Gray Taylor
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David Ezell
Director of New Initiatives
Conexxus
dezell@conexxus.org
About Conexxus

• We are an independent, non-profit, member driven technology organization
• We set standards…
  – Data exchange
  – Security
  – Mobile commerce
• We provide vision
  – Identify emerging tech/trends
• We advocate for our industry
  – Technology is policy
<table>
<thead>
<tr>
<th>Month/Date</th>
<th>Webinar Title</th>
<th>Speaker</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 23, 2020</td>
<td>How to elevate your business through digital transformation</td>
<td>Dean Marier</td>
<td>Cybera</td>
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<tr>
<td>February 27, 2020</td>
<td>Progress in the “API Sprint”</td>
<td>Gray Taylor, David Ezell</td>
<td>Conexxus</td>
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<tr>
<td>March 18, 2020</td>
<td>Data Security Beyond PCI: Securing the Enterprise</td>
<td>Ed Adams, Mark Carl, Chad Kobayashi, Sam Pfanstiel</td>
<td>Security Innovation, ControlScan, Maverik, ControlScan</td>
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<td>April 2, 2020</td>
<td>Presentation by GS1</td>
<td>Liz Sertl</td>
<td>GS1</td>
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<td>April 2020</td>
<td>Ransomware protection and how a managed security service provider can help oil &amp; gas retailers from being the next target</td>
<td>Ajith Edakandi</td>
<td>Hughes Network</td>
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<td>May 2020</td>
<td>POS Managed Service Program</td>
<td>TBD</td>
<td>Joint MNSP’s</td>
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<td>June 2020</td>
<td>Penetration Testing</td>
<td>Geoff Vaughan</td>
<td>Security Innovation</td>
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## 2020 Conexxus Webinar Schedule

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<tr>
<th>Month/Date</th>
<th>Webinar Title</th>
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<tr>
<td>July 2020</td>
<td>PCI DSS 4.0</td>
<td>Troy Leach</td>
<td>PCI SSC</td>
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<td>August 2020</td>
<td>Vulnerability &amp; Patch Management—Retail Operations</td>
<td>TBD</td>
<td>POS Vendors</td>
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<td>September 2020</td>
<td>TBD</td>
<td>Scott Cheek</td>
<td>SageNet</td>
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2020 Conexxus Annual Conference

April 26 – April 30, 2020
Loews Ventana Canyon
Tucson, AZ

More about Sponsorship Opportunities & Registration:
www.Conexxus.org

Conexxus thanks our 2019 Annual Diamond Sponsors!
Rewiring the Enterprise = Reducing Tech Debt

Central Nervous System & Memory (amorphous)

NEW Innovation APIs
- Machine Learning
- Predictive analytics

NEW Analytics Data APIs

NEW Partner Data Exchange APIs

NEW Structured Data APIs

Structured legacy data exchange APIs

NEW In-store system APIs

 Associates
 Suppliers
 Customers

E.g. delivery service, payment innovation, etc.

In-store system APIs

E.g. IOT, consumer data feeds, weather, news, forecasts

In-store system APIs

HQ/Admin

Conexxus
Technical Debt

It is the unrealized cost required to take a tech stack from where it is, to where it should be:

- Not measured on balance sheet, but some hints are on P&L through maintenance and upgrade OpEx

Causes:
- Failure to use Standards & APIs
- Failure to take “platform” approach
- Failure of “future-back” analysis
- Feature enhancements forced by competitor (e.g. cashierless store)
- The true cost of digital transformation
- We all have it….
NACS/Conexxus Investment in the Future

- 2019, NACS invested $200,000 to fund Conexxus development of API strategy
  - Save time and NRE of digital transformation
- 2020, NACS has committed $1M to fund the API "Factory" model
  - Achieve strategic efficiencies through standardized APIs
  - Plan driven by retailer prioritization
  - Greatly enhance our competitive position
  - Foster innovation "test and learn" cycles
- We believe this initiative will save the industry millions...
- YOU need to engage to help us invest wisely
API Sprint: Goals

• Continue to Expand the Industry Data Dictionary
• Leverage existing Conexxus Standards
• Develop technology and management talent
• Develop and deploy an architecture that
  – Leverages existing Conexxus Standards
  – Minimizes retailer technical debt in new APIs
The API Sprint

- Conexxus API “Factory” Initiative
  - Collaborative Environment using GitLab
  - “Table-stakes” architecture description
  - RBR Approved Conexxus API work
  - Potential Conexxus API work
- Process for APIs
- Staffing for “32” table stakes APIs, certified and in repositories
Open Retailing: A collaboration between IFSF and Conexxus

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February, 2020 Press Release

Conexxus and International Forecourt Standards Forum Announce Standardized API Initiative, Creation of Public Repository for Industry Review and Comment
API Design Guidelines

Introduction

Conxxus and IFSF have worked with retailer and supplier (developer) members to assemble a set of documents to describe how to create an API for consideration as an industry standard. While there are many languages, formats, and tools available to create APIs, Conxxus and IFSF are focusing on those that are most standardized, and most likely to be useful in a variety of the environments in Convenience Retail computing.

Rationale for Selections

Specifically, the participants have singled out the following tools and standards as having the broadest scope:

- Open API Specification 3.0 - formerly "Swagger," this API definition format has become the de facto standard for APIs.
- JSON-Schema 0.7 - as standards organizations, we require a way to define and compose message content. JSON-Schema is the emerging standard in JSON family of tools, and is compatible with OAS 3.0.
- HTML5 - Capabilities in HTML are ubiquitous, and are included in almost all server and client side development environments.
Welcome to the **API Data Dictionary** ("Dictionary"), jointly owned by the IFSF ([www.ifsf.org](http://www.ifsf.org)) and Conexxus ([www.conexxus.org](http://www.conexxus.org)), and shared in order to assist in the use of our international standards.

This version is a DRAFT and is for discussion only. It is improper to attempt to use the definitions herein in live applications or to cite this version other than as a work in progress.

This Dictionary is created specifically for use in petroleum and convenience retail. The definitions in the Dictionary have been in wide use for almost two decades.

Ultimately, the dictionary will contain the following directories:

- schemas: this directory contains the business domain items (elements, types, objects).
- traits: contains definitions useful across the set of all APIs, but outside the business domain.
- utilities: contains definitions useful for messaging, but outside the business domain.
- examples: contains example files conforming to various definitions.
API Data Dictionary: Status

• DRAFT dictionary – completed 21 February, 2020
• Contributions
  – IFSF – data definitions from FDC
  – Conexxus – data definitions from POS/BO
• Process
  – TAC approves overall structure (approved)
  – FDC approves IFSF contribution
  – POS/BO approves Conexxus contribution
API Sprint Architecture Motivation

• IR4.0 data processing focuses on raw data…
  – Lower cost – little or no tech debt, especially if standard
  – More accurate – original sources are more reliable
  – More informative – lots of information, not just values

• … But merchants often don’t have direct control
  – Acquiring the data often requires customization.
  – Paying more for your data is like paying a loan with another loan.

To compete in the “disruptive ecosystem,” merchants need fast/frictionless access to their own standardized data.
C-Store Topology: Today

Store

- POS 1
- POS 2
- FDC

Store Controller

Back Office System
- Store Ops

Remote

- Price Book
- Accounting
- Reporting
- Analysis

Standards
C-Store Topology: Future

POS 1-N
BYOD
Line Buster
Fueling Point POS
Unattended POS

Price Book
Accounting
Reporting
Analysis

Supply Chain
AI Promotions
Predictive Analysis
Ops Analysis (IoT)
C-Store Topology: Solution

All problems in computer science can be solved by another level of indirection, except for the problem of too many layers of indirection. -- Edsger Dijkstra
API Sprint

Store
- POS 1-N
- BYOD
- Line Buster
- FP POS
- UA POS
- Store Ops

Remote
- Price Book
- Accounting
- Reporting
- Analysis
- Supply Chain
- AI Promotions
- Predictive Analysis
- Ops Analysis (IoT)

POS Data Configuration Controller
- PDCA
- Push
- Pull

POS Activity Reporting Controller
- PARA
- Push
- Pull
- Push
- Pull
Where are these controllers?

- Might be in store (small server)
  - Very close to existing architecture
  - “Always on,” at least as good as today
- In the cloud, managed by:
  - Existing supplier (e.g., POS supplier, Back Office supplier)
  - Third party (it’s a new line of business)
  - Or… the merchant
API Sprint Result

• Suppliers control software
• Suppliers use and contribute data
• Retailers control data
## RBR Approved API Development

<table>
<thead>
<tr>
<th>API Group</th>
<th>API Count</th>
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<tbody>
<tr>
<td>POS Activity Reporting (PARA)</td>
<td>7</td>
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<tr>
<td>POS Data Configuration (PDCA)</td>
<td>5</td>
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<tr>
<td>Cloud POS Calculator (CPCA)</td>
<td>2</td>
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<tr>
<td>Forecourt Device Controller</td>
<td>9</td>
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<tr>
<td>Digital Offers</td>
<td>4</td>
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<td>Carwash Controller</td>
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<th>Journal Activity Reporting</th>
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<td>Business Interval</td>
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<td>Transaction Event</td>
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<tr>
<td>Summary</td>
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<td>Merchandise Code (Department)</td>
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<tr>
<td>Fuel</td>
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<td>Tax</td>
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<td>Tender</td>
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<tr>
<td>Carwash Controller</td>
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</tbody>
</table>

## API Count

- Site Data Management: 1
- Merchandising Data Management: 1
- Fuel Data Management: 1
- Tax Data Management: 1
- Workforce Data Management: 1
Potential API Development

- Loyalty
- Mobile Payments
- Gift Card FEP
- Supply Chain
- Fuel Dispenser POS
Process
Standards process… tomorrow

Enter the “Factory”
1) Full feature API code for integration
2) Lifecycle mgt, backward compatible
3) Implementation consistency

OBJECTIVES:
1) Full data interactivity supported
2) Latest version capability

KEY LEARNING
To truly accelerate standards delivery, we need innovators, not IT driving agenda!
### API Functional Process Flow

#### Program Management
- Manage priority, resources & operation
- Select/Enlist API contributor
- Manage repository
- Manage defined product lifecycle cycle
- Key Liaison to Conexxus/IFSF (Long-term position)

#### Project Management / Development
- Manage individual API projects
- Manage contributors
- Manage contractors and other “factory” developers
- Work with Committees to define work product (Could be contributors from retail members?)
- (At least one long-term SME for consistency)

#### Documentation
- Convert specification to developer documentation
- API acceptance criteria (from QA)
- (Expanded standard document formats to be used by committees)

#### Quality Assurance
- Acceptance criteria – defined by SQA
- DevOps testing tools
- Acceptance testing tools (Should ultimately be automated function - tools)

#### Support
- Level 3 developer support
- Bug base management
- Platform improvement feedback (Long-term position)

#### Design, Specification, Funding, Oversight & Voice of Customer
- Conexxus - IFSF

#### API Repository
- Owned and managed by:
  - Conexxus - IFSF

#### API contributor/developer (vendor, retailer, contractor)
Donated APIs

<table>
<thead>
<tr>
<th>Member</th>
<th><em>staff</em> (TBD)</th>
<th>API Focus Working Group</th>
<th>Retailer Business Requirements (RRR)</th>
<th>SQA</th>
<th>TAC</th>
<th>Committee/Working Group</th>
<th>Factory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donation of API with API Disclosure</td>
<td>Accept?</td>
<td>Review API: Focus on Concept of API and security in API protocol; is it useful?</td>
<td>Review API: Focus on &quot;Good use of resources&quot;</td>
<td>Review API: Focus on completeness of API documentation guidelines, data dictionary and acceptance policy</td>
<td>Review API: Focus on any conflict with current work and conformance to API design guidelines, data dictionary and acceptance policy</td>
<td>Approved?</td>
<td>Approved?</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Accept?</td>
<td>Yes</td>
<td>Approved</td>
<td>Approved</td>
<td>Approved</td>
<td>Approved?</td>
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<td>Notify member: Ask for awareness &amp; assistance (or) reject submission</td>
<td>Yes</td>
<td>Publish API to &quot;Lake&quot;</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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</tbody>
</table>

Develop API documentation for:  
- APIs  
- Use cases  
- Certifications tools  

Review Factory Output  
Develop (if needed) additional documentation  
Approved?
Staffing
API Development: Managed Roles

• Advisory Architect
• API Definer
• API Writer
  – Application Definition (OAS 3.0) writer
  – JSON Examples writer
  – Documentation writer
  – Tutorial developer/writer
• Testbed/Certification Engine developer
• Test case developer
Relevant Workstreams for APIs

• Maintain core documentation (4 documents)
• Research (protocols, security, other technologies)
• Data Dictionary submission coordination
• Create APIs
## API Creation Workstream breakdown

<table>
<thead>
<tr>
<th>Block</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Business Requirements Document (API specific)</strong></td>
<td></td>
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<tr>
<td><strong>API Resource Identification Document</strong></td>
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<tr>
<td><strong>API definition</strong></td>
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<tr>
<td>- OAS root document (YAML)</td>
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<tr>
<td>- API specific definitions (YAML), Data Dictionary submissions</td>
<td></td>
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<tr>
<td>- JSON examples</td>
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<td>- Threat model and document</td>
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<tr>
<td><strong>Test case development</strong></td>
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<tr>
<td>- Focus on positive and negative cases, extensibility points (if any), “invariants”</td>
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<tr>
<td><strong>API interop testbed development</strong></td>
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<td><strong>Certification engine development (use the test cases)</strong></td>
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<td><strong>Security review</strong></td>
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<tr>
<td><strong>Documentation</strong></td>
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<tr>
<td>- Observer documentation (concrete -&gt; abstract)</td>
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<td>- Developer documentation (implementation guide)</td>
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<tr>
<td><strong>Tutorial development</strong></td>
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</table>
API Development: Resources

• Existing Resources
  – Conexxus Staff
  – Committee / Work Group Members

• Proposed New Resources
  – API Initiatives Coordinator (boarding - Q1)
  – API Initiatives Professional Project Manager (boarding – Q2)
  – Contractors (boarding – Q2)
  – Factory Developers (boarding – Q3)
<table>
<thead>
<tr>
<th>API Group</th>
<th>B</th>
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<tr>
<td>POS Activity Reporting (PARA)</td>
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<td>Phase 1</td>
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<td>Gift Card FEP</td>
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• Email: info@conexxus.org
• LinkedIn Profile: Conexxus.org
• Follow us on Twitter: @Conexxxusonline
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