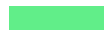




# Portal Self-service

Back-end View, and Improvements



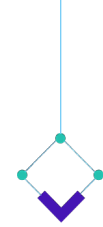
**Riccardo Verzeni**









Director of Software Engineering

Tuesday, 23rd November 2022

LINX117





-  **Order Management System** 
-  **Main components** 
-  **Current utilisation** 
-  **Future developments** 

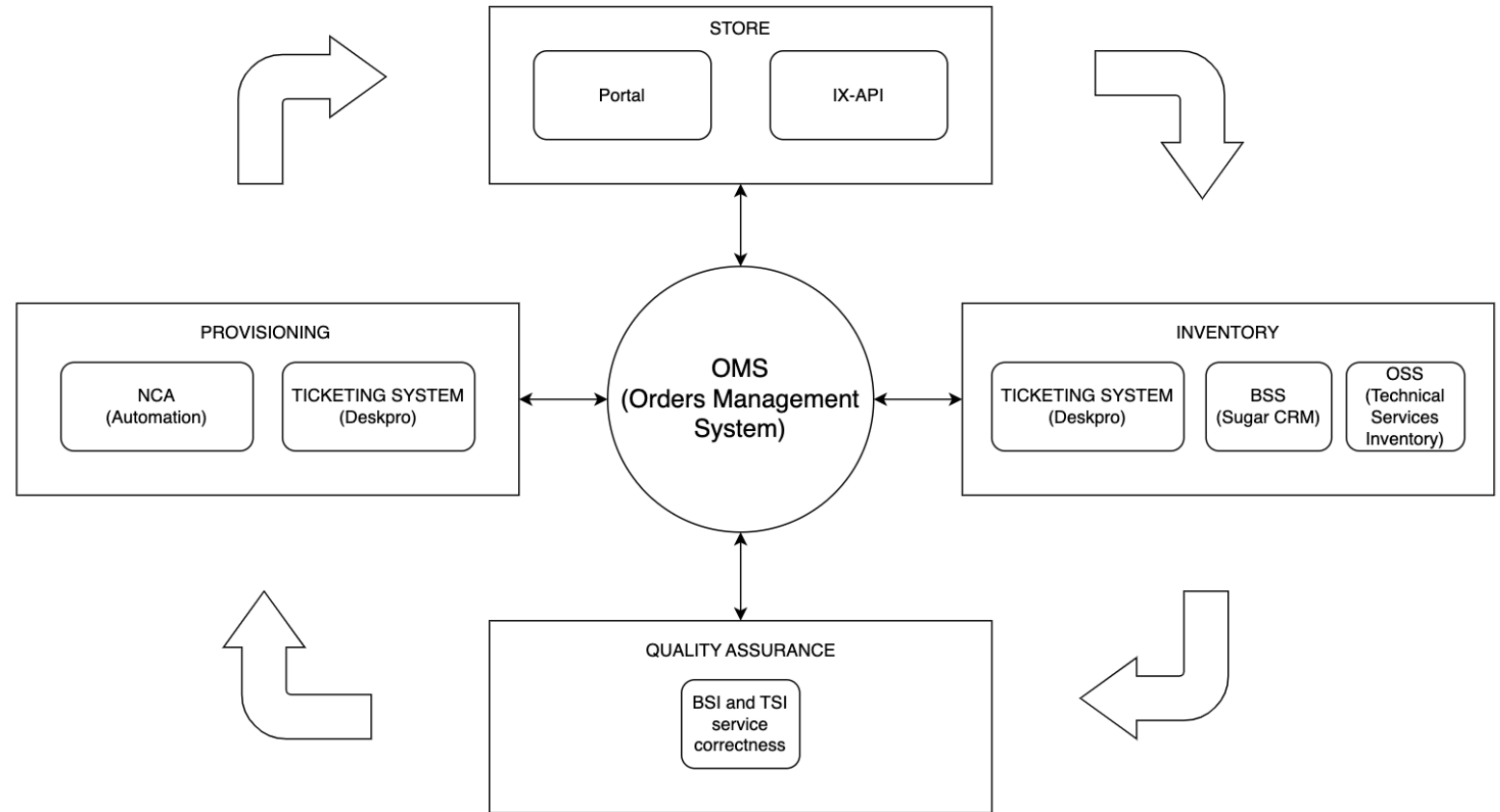


# 1. Order Management System



# Orders Management System

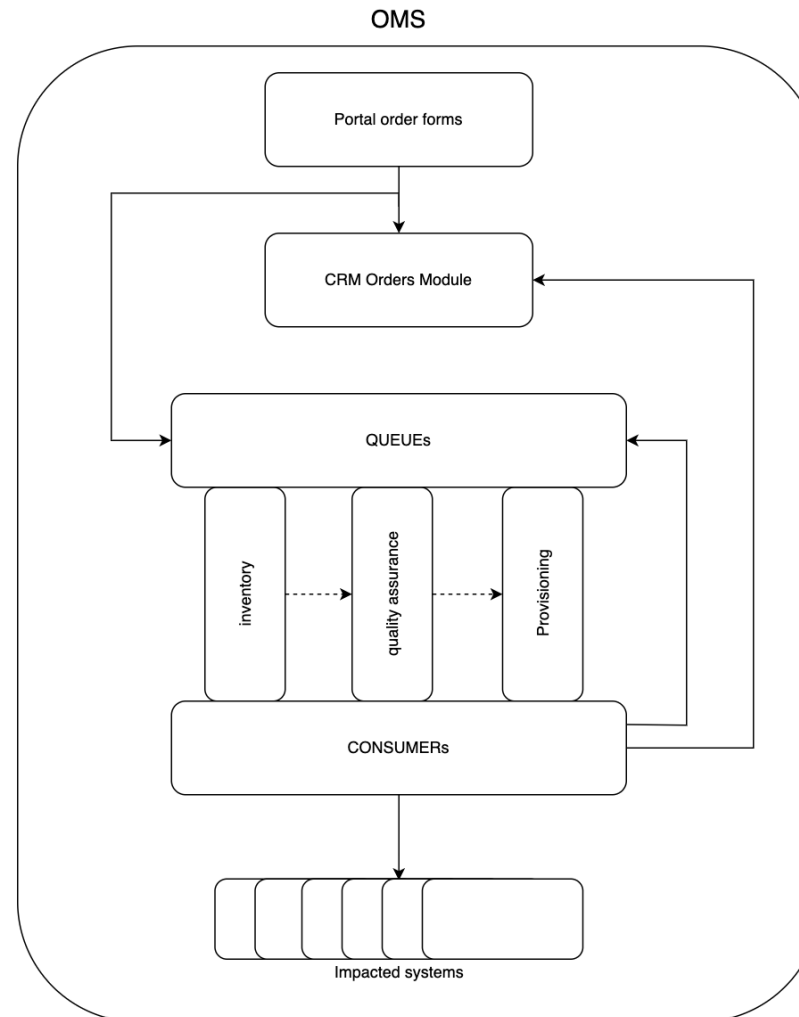
- Store
- Inventory
- Quality Assurance
- Provisioning





# Orders Management System

- Order is recorded in CRM and sent to Messaging Queue
- Orders consumed and progressively moved in subsequent queues
- The consumers interact with various systems and also update the status of the order and order items



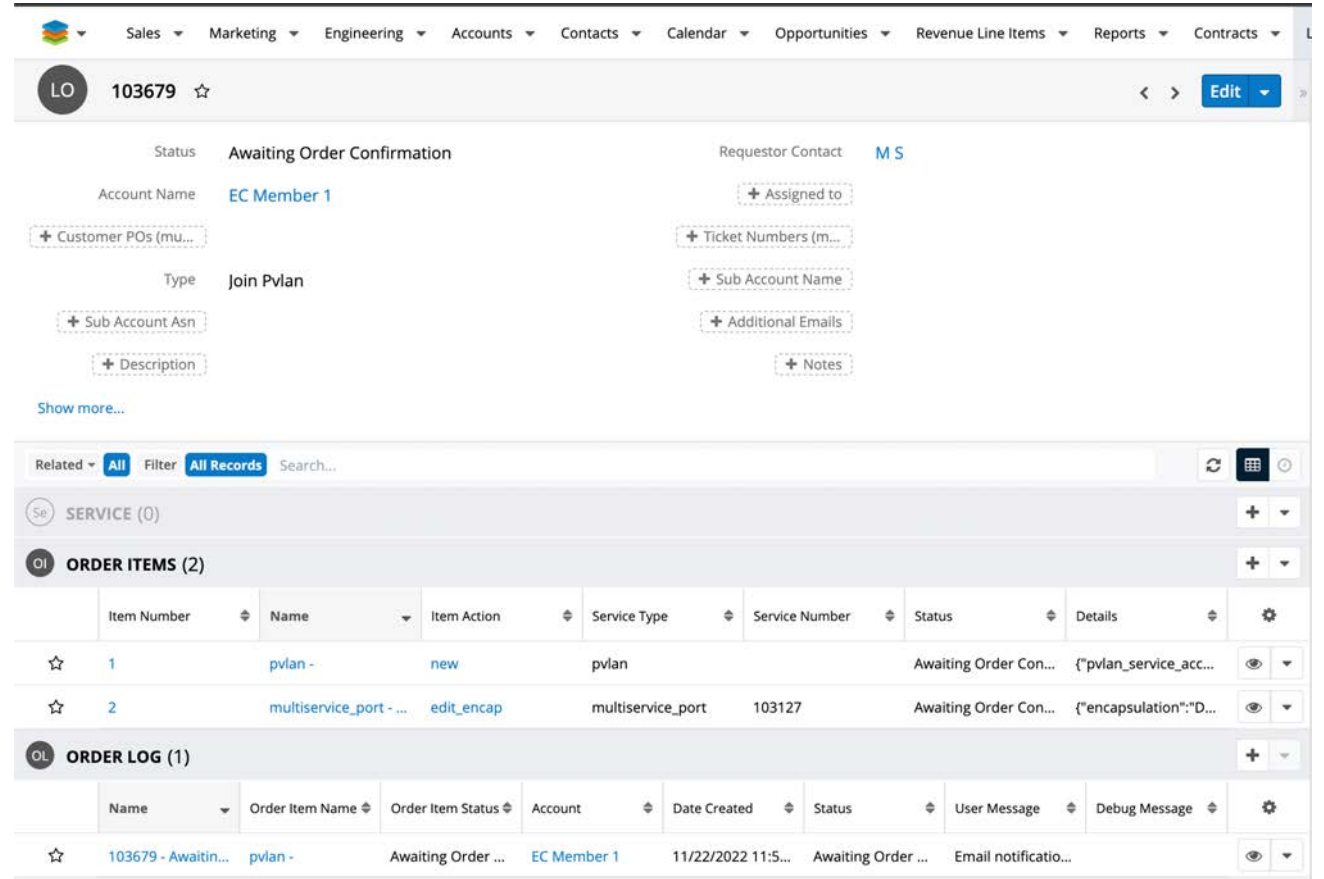


## 2. Main components



# Orders CRM Module

- LINX Orders:
  - User info and order status
- Order Items:
  - Service type and action
  - Status
  - Details used by the messaging queue consumer.
- Order Logs:
  - Internal debugging
  - User communications



The screenshot displays the LINX CRM interface for the Orders module. At the top, a navigation bar includes menus for Sales, Marketing, Engineering, Accounts, Contacts, Calendar, Opportunities, Revenue Line Items, Reports, and Contracts. Below this, a header section shows the order ID 'LO 103679' and an 'Edit' button. The main content area is divided into two columns of metadata. The left column includes fields for Status (Awaiting Order Confirmation), Account Name (EC Member 1), Type (Join Pvlan), and Description. The right column includes fields for Requestor Contact (MS), Assigned to, Ticket Numbers, Sub Account Name, Additional Emails, and Notes. Below the metadata is a 'Show more...' link. The interface then shows a 'Related' section with a search bar and a list of related records. The first section is 'SERVICE (0)'. The second section is 'ORDER ITEMS (2)', which contains a table with the following data:

Item Number	Name	Item Action	Service Type	Service Number	Status	Details
1	pvlan -	new	pvlan		Awaiting Order Con...	{ "pvlan_service_acc...
2	multiservice_port - ...	edit_encap	multiservice_port	103127	Awaiting Order Con...	{ "encapsulation": "D...

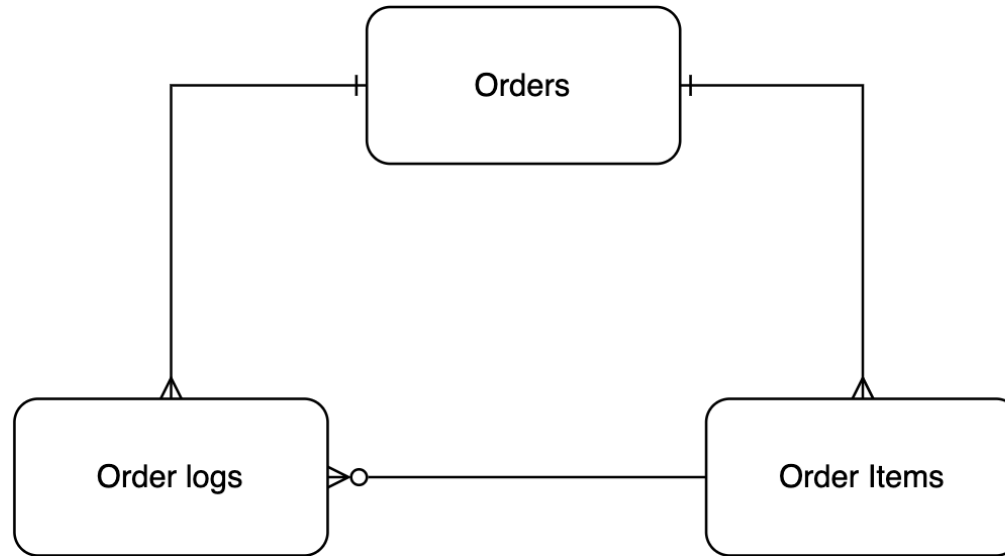
The third section is 'ORDER LOG (1)', which contains a table with the following data:

Name	Order Item Name	Order Item Status	Account	Date Created	Status	User Message	Debug Message
103679 - Awaitin...	pvlan -	Awaiting Order ...	EC Member 1	11/22/2022 11:5...	Awaiting Order ...	Email notificatio...	



# Orders CRM Module

Orders, Order items and Order logs Relationship







## Orders API module

- Manages all interaction with orders, order items and order logs and all other involved systems.
- Works in parallel with:
  - Services API module
  - NCA Actions API module
  - Deskpro API

Order Management System			^
GET	/oms/orders	Fetch result set of OMS orders	▼ 🔒
POST	/oms/orders	Create a new order in the OMS	▼ 🔒
GET	/oms/orders/{orderId}	Fetch a single OMS order by ID	▼ 🔒
PATCH	/oms/orders/{orderId}	Partial update of an existing order in the OMS	▼ 🔒
GET	/oms/order-items/{orderItemId}	Fetch a single OMS order item in an order by order item ID	▼ 🔒
GET	/oms/order-items	Fetch result set of OMS order items	▼ 🔒
GET	/oms/order-logs	Fetch order logs	▼ 🔒
POST	/oms/order-logs	Create a new order log record for the OMS	▼ 🔒





## Orders API module

- Base order structure example
- Reseller example: sub\_customer field (not present in direct member orders)

```
1 {
2   "id": "be5b3224-bb1d-11ec-945b-005056beff67",
3   "name": "100472",
4   "status": "inventory",
5   "requestor" {
6     "contact_id": "4324-efd-432423-23",
7     "account_id": "2314-cba-122425-71",
8     "organisation": "LINX",
9     "email": "edward@linx.net",
10    "full_name": "Edward Weld",
11    "phone": "123456789",
12  },
13  "sub_customer": {
14    "organisation": "100 Percent Done",
15    "account_id": "4714-uva-122425-71",
16    "asn": "12345",
17    "handle": "subcustomer_handler",
18  },
19  "deskpro_ticket_id": 21702,
20  "po_number": "Reference goes here",
21  "additional_cc": ["cc@mail.com"],
22  "notes": "additional notes", // used only in non-automated order
23  "type": "normal|join_pvlan",
24  "description": "Order description",
25  "created_at": "2022-04-13T12:34:56+01:00",
26  "modified_at": "2022-04-13T12:35:08+01:00",
27  "items": [...]
28 }
```





## Orders API module

- Order items example  
(New Connexions unit)

```
1 "items": [  
2   {  
3     "id": "beea7c36-bb1d-11ec-a04a-005056beff67",  
4     "item_number": 1,  
5     "status": "inventory",  
6     "item_action": "new",  
7     "service_type": "connexions",  
8     "service_number": <service_number>, // new service created by this order  
9     "deskpro_ticket_id": 12346,  
10    "created_at": "2022-04-13T12:34:57+01:00",  
11    "modified_at": "2022-04-13T12:35:05+01:00",  
12    "details": {  
13      "port_group_id": "41d3685c-957f-11ec-b007-005056beff67",  
14      "bandwidth": 0,  
15      "vlan_id": 123,  
16      "mac_address": "12:13:14:15:16:17",  
17      "location": "Mon",  
18      "fabric": "jsp1",  
19      "connexions_port": "edge2-dev ge-3/0/1",  
20    }  
21  }  
22 ]  
23
```





## Orders Processor

- Order processor is a python script and it's run by the consumers of the messaging queue
- 3 queues to serve (inventory, quality\_assurance, provisioning)
- the steps to do for each order are the same:
  - to process all order items
  - to change status of the order (failed if any of the items wasn't processed correctly)
- for each queue there is one main class which is handling all the messages in the queue
- for each order item there is a separate "handler" class which is handling the steps for each order item
- Each order item is the combination of a service type and an action

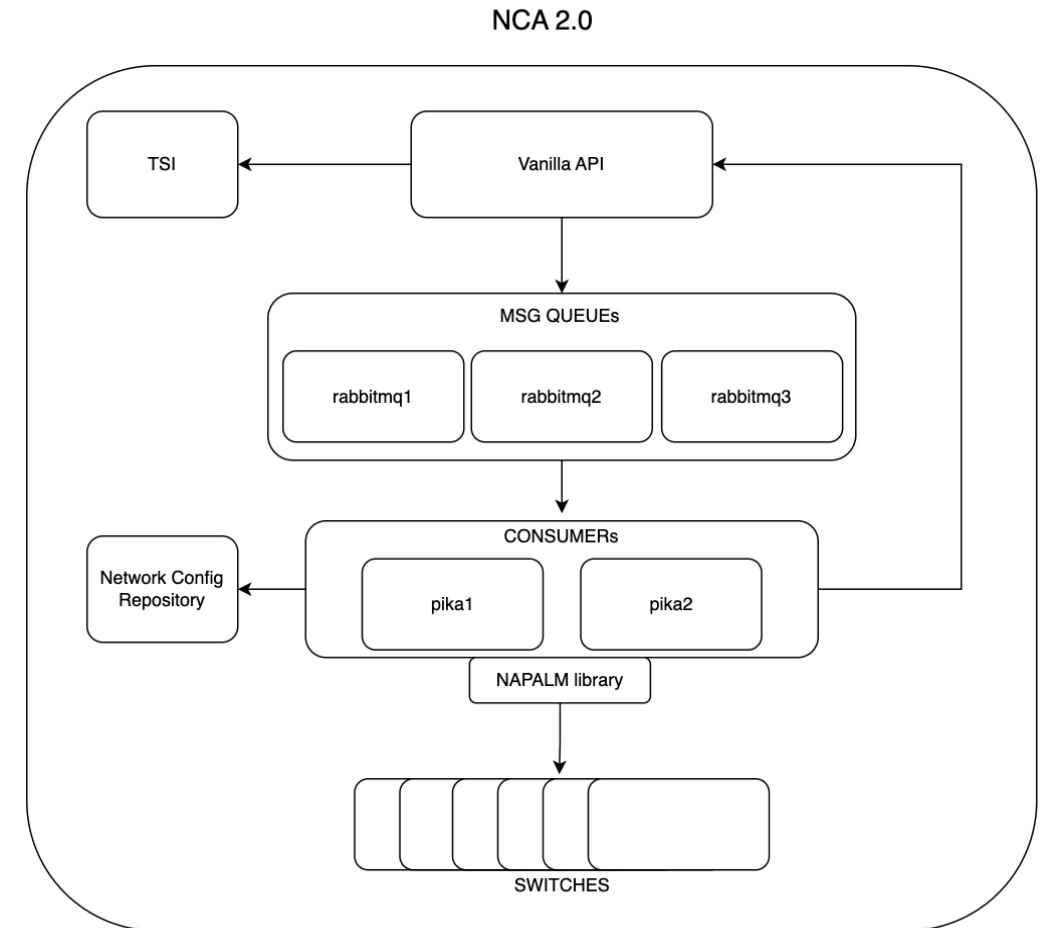
```
1 oms-processor/  
2 |─ configuration  
3 | |─ config.example.yml  
4 |─ environment.yml  
5 |─ oms_processor  
6 | |─ conf.py  
7 | |─ exception.py  
8 | |─ exchange.py  
9 | |─ __init__.py  
10 |─ job  
11 | |─ base.py  
12 | |─ __init__.py  
13 | |─ inventory  
14 | | |─ __init__.py  
15 | | |─ base.py  
16 | | |─ reseller_peering_unit_new.py  
17 | |─ quality_assurance  
18 | | |─ __init__.py  
19 | | |─ base.py  
20 | | |─ reseller_peering_unit_new.py  
21 | |─ provisioning  
22 | | |─ __init__.py  
23 | | |─ base.py  
24 | | |─ reseller_peering_unit_new.py  
25 | |─ util.py  
26 |─ __main__.py  
27 |─ worker.py  
28 |─ pylintrc  
29 |─ README.md  
30 |─ setup.py  
31 |─ tests  
32 | |─ __init__.py  
33 | |─ ...  
34 |─ tox.ini  
35
```





## Orders Provisioning

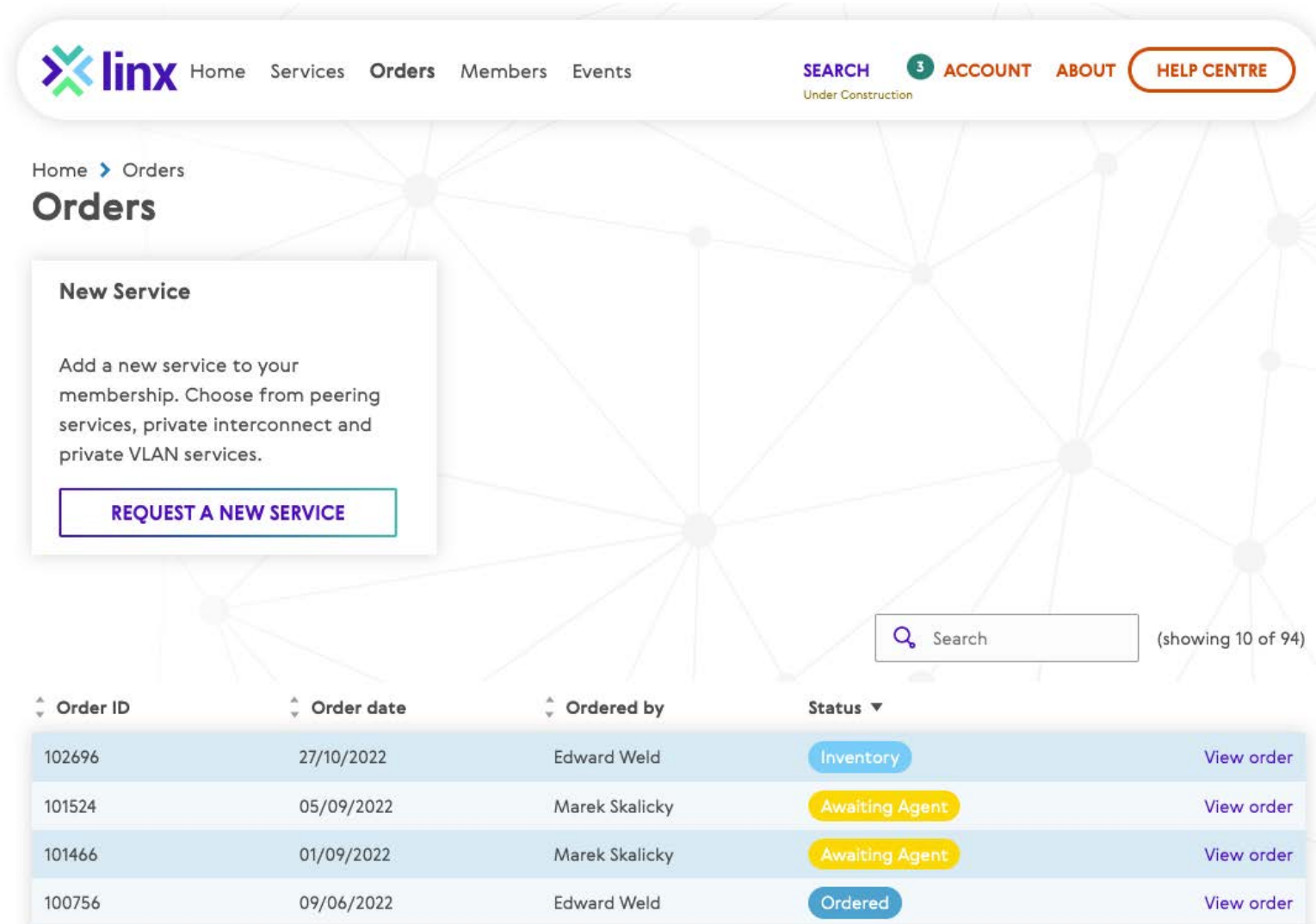
- The order provisioning on the network is done via NCA 2.0.
- This is the second generation of LINX Network Configuration Automation tool, and it was designed specifically for member related, low risk, unsupervised config merges.
- NCA Actions API triggers the deployment sending a message containing all necessary info to the messaging queue. The consumer deploys the change and updates the network config repo and TSI (LINX OSS) via Service API module.





# Orders Portal

- Orders are exposed to the end user via portal Orders page.
- This is powered by the orders APIs module showed before



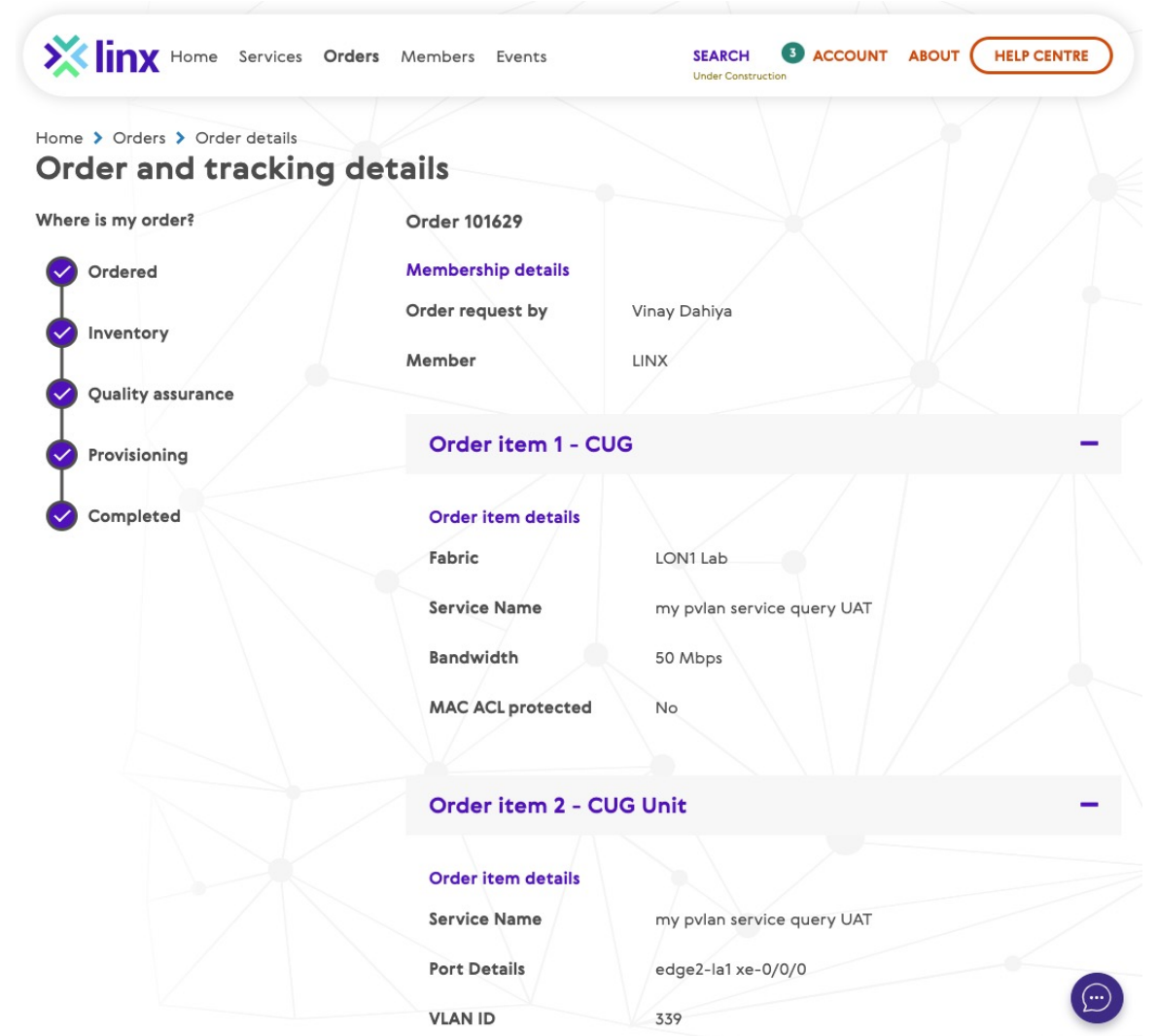
The screenshot shows the Linx Orders Portal interface. At the top, there is a navigation bar with the Linx logo, links for Home, Services, Orders, Members, and Events, and buttons for SEARCH (Under Construction), ACCOUNT (3), ABOUT, and HELP CENTRE. Below the navigation bar, the breadcrumb 'Home > Orders' is visible, followed by the main heading 'Orders'. A 'New Service' card is prominently displayed, inviting users to 'Add a new service to your membership' and providing a 'REQUEST A NEW SERVICE' button. Below this, there is a search bar and a table of orders. The table has columns for Order ID, Order date, Ordered by, Status, and a 'View order' link. The table shows four orders with various statuses: Inventory, Awaiting Agent, Awaiting Agent, and Ordered.

Order ID	Order date	Ordered by	Status	
102696	27/10/2022	Edward Weld	Inventory	<a href="#">View order</a>
101524	05/09/2022	Marek Skalicky	Awaiting Agent	<a href="#">View order</a>
101466	01/09/2022	Marek Skalicky	Awaiting Agent	<a href="#">View order</a>
100756	09/06/2022	Edward Weld	Ordered	<a href="#">View order</a>



# Orders Portal

- When clicking on “View order” additional order details are exposed including:
  - Order items
  - Order logs



The screenshot displays the Linx Orders Portal interface. At the top, there is a navigation bar with the Linx logo, menu items (Home, Services, Orders, Members, Events), and utility links (SEARCH, ACCOUNT, ABOUT, HELP CENTRE). The main content area shows the breadcrumb "Home > Orders > Order details" and the title "Order and tracking details".

On the left, a vertical progress indicator titled "Where is my order?" shows five steps: Ordered, Inventory, Quality assurance, Provisioning, and Completed, all marked with checkmarks. The "Completed" step is currently selected.

The main content area displays details for "Order 101629". It includes a "Membership details" section with "Order request by" (Vinay Dahiya) and "Member" (LINX). Below this, there are two expandable sections for "Order item 1 - CUG" and "Order item 2 - CUG Unit".

**Order item 1 - CUG details:**

Fabric	LON1 Lab
Service Name	my pvlan service query UAT
Bandwidth	50 Mbps
MAC ACL protected	No

**Order item 2 - CUG Unit details:**

Service Name	my pvlan service query UAT
Port Details	edge2-la1 xe-0/0/0
VLAN ID	339

A chat icon is visible in the bottom right corner of the page.





# Orders Tickets

- Order processor (a.k.a the messaging queue consumer) interacts with the ticketing system via its APIs (Deskpro APIs).
- Creates tickets in Sales queue when manual processing order.

MESSAGES FULL LOG DATES & TIMES

#1 LINX Order Management System <O... 7 days ago

**\*New LINX Port Order\***  
A new port order has been received via the LINX Portal  
(Order ID: 103492)

**\*Member Details\***  
Organisation Name:..... LINX  
Full Name:..... Edward Weld  
Email:..... edward@linx.net  
Phone:.....

**\*New Port details\* (order item 1)**  
Peering LAN:..... imn1  
Location:..... SEC  
Port Capacity:..... 1000  
Quantity:..... 1  
Encapsulation:..... None

Port Type:..... multiservice\_port  
Presentation Type:..... SC/PC (Single-mode fibre)  
Connected via:..... Layer 2 Provider

**\*Additional Service changes\***  
**\*Peering unit Service Details\* (order item 2)**  
Port:..... Use the new multiservice port  
Peering LAN:..... imn1  
Location:..... SEC  
Service Capacity:..... 1000  
Mac address:..... 11:11:11:11:11:11

Default ID: 31953 OMS: New port service order from LINX (Order ID: 103492)

Edward Weld (edward@linx.net) LINX Limited

Add CC

Sales Awaiting Agent 1

PROPERTIES TASKS (0) FOLLOW UPS (0) SLAS ●●●●●●

BILLING

Agent - Assign to Me Team  
Unassigned None

Labels: Add a label

Problem: None

Product: Member Port

Category: Member Request

otrs\_ticket\_number:

otrs\_ticket\_id:

area:

Peering LAN: IMN1

Priority: Severity 4

Prov Status: New

Provisioning:

Site: ManxIX > SEC

Prov Port Type: 1G

SatisfactionRequest:

Alarm Source:

Escalated to 2nd / 3rd line - NETENG: None

A End:

B End:

Escalated to Software - DEV: None





# Orders Tickets

- Creates tickets in Provisioning queue, when self-service order.
- Updates the ticket with the automatic provisioning main progress.
- Adds more verbose notes for NOC.
- Changes the status of the ticket according to the automatic provisioning status.

MESSAGES FULL LOG DATES & TIMES

#9 LINX Order Management System ... 5 months ago

NOTE Services for all order items provisioned.

#8 LINX Order Management System ... 5 months ago

NOTE Service 106552 is connected now.

#7 LINX Order Management System ... 5 months ago

NOTE Provisioning items

#6 LINX Order Management System ... 5 months ago

NOTE Services for all order items validated.

#5 LINX Order Management System ... 5 months ago

NOTE All service checks completed for service 106552.

#4 LINX Order Management System ... 5 months ago

NOTE Starting quality assurance check for the order.

#3 LINX Order Management System ... 5 months ago

NOTE New service created for order item 1. Service number 106552

#2 LINX Order Management System ... 5 months ago

NOTE Creating services for order items.

#1 LINX Order Management System ... 5 months ago

**\*ConneXions Member Service modification order\***

A ConneXions service modification order has been received via the LINX Portal, this order is handled via OMS

**\*ConneXions Partner Details\***

Organisation Name:..... LINX  
 Full Name:..... Marek Skalicky  
 Email:..... marek@linx.net  
 Phone:.....

**\*LINX Member Details\***

Organisation Name:..... EC Member 1  
 Member Handle:..... ecmem1

**\*Existing ConneXions Member Service Details\***

ConneXions Port:..... edge2-dev  
 ge-3/0/1.0 C915917  
 LAN:..... jsp1  
 Location:..... Mon  
 VLAN ID:..... 701  
 Service Capacity:..... 2000

\*Requested View Full Message

Default ID: 27297 OMS: Connexions port change service request from LINX

Marek Skalicky (marek@linx.net) LINX Limited

Add CC

Provisioning Resolved

PROPERTIES TASKS (0) FOLLOW UPS (0) SLAS ●●●●●●

BILLING

Agent - Assign to Me Team

Unassigned None

Labels: Add a label

Problem: None

Product: Member Port

Category: Member Request

otrs\_ticket\_number:

otrs\_ticket\_id:

area:

Peering LAN: JSP1

Priority: Severity 4

Prov Status: New

Provisioning: ConneXions > CX Member Port - Downgrade

Site: N/A

Prov Port Type: ConneXions

SatisfactionRequest:

Alarm Source:

Escalated to 2nd / 3rd line - NETENG: None

A End:

B End:

Escalated to Software - DEV: None



## Orders Tickets

- Creates an additional read-only ticket for Sales Queue, when self-service order.

MESSAGES FULL LOG DATES & TIMES

#1 LINX Order Management System <O... 6 days ago

NOTE

The service will be provisioned by self service automation. No action from sales is required. Provisioning ticket number: 32034. Order ID: d2495eba-65b2-11ed-aef4-005056beff67

#2 LINX Order Management System <O... 6 days ago

**\*New Private VLAN order\***

A new private vLAN order has been received via the LINX Portal  
(Order ID: 103523)

**\*PVLAN Service Details\* (order item 1)**  
LAN:..... edi2  
Service Type:..... Point to Point  
Service Name:..... test-p2p-ecl-ec2  
Bandwidth:..... 50  
MAC ACL Protected:..... False

**\*Member Details\***

Organisation Name:..... LINX  
Full Name:..... Mr. Vytautas Bauras  
Email:..... vytautas@linx.net  
Phone:.....

(order item 2)  
Port:..... edge1-la2-lon2 xe2  
VLAN ID:..... 444





### 3. Current Utilisation



# Current Utilisation

LINX Order (9) [Create](#) >>

Filter [Build Filter](#) Search by name...

<input type="checkbox"/>	<input type="checkbox"/>	Name	Status	Requestor Contact	Account Name	Assigned to	
<input type="checkbox"/>	☆	10	Manual Processing				
<input type="checkbox"/>	☆	9	Completed				
<input type="checkbox"/>	☆	8	Manual Processing				
<input type="checkbox"/>	☆	7	Completed				
<input type="checkbox"/>	☆	6	Manual Processing				
<input type="checkbox"/>	☆	5	Manual Processing				
<input type="checkbox"/>	☆	4	Manual Processing				
<input type="checkbox"/>	☆	3	Error				
<input type="checkbox"/>	☆	2	Error				





# Current Utilisation

LO 7 ☆
< > Edit ▾

Sub Account Asn [blurred] + Additional Emails

+ Description + Notes

[Show more...](#)

Related ▾ All Filter All Records Search...

Se **SERVICE (0)** + ▾

Service Name	Service Type	Tech. Summ...	Service ...	Property Values	Billing S...	Billing E...	Service Details
No data available.							

Ol **ORDER ITEMS (1)** + ▾

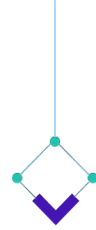
Item Number	Name	Item Action	Service Type	Service Number	Status	Details
☆ 1	<a href="#">connexions - 29811</a>	new	connexions	29811	Completed	{"asn":33891,"port_...

OL **ORDER LOG (6)** + ▾

Name	Order Item Name	Order Item Status	Account	Date Created	Status	User Message
☆ 7 - Inventory			<a href="#">[blurred]</a>	11/04/2022 03:0...	Inventory	Creating services for order items.
☆ 7 - Inventory	<a href="#">connexions - 29811</a>	Quality Assurance	<a href="#">[blurred]</a>	11/04/2022 03:0...	Inventory	New service created for order it...
☆ 7 - Quality Assur...			<a href="#">[blurred]</a>	11/04/2022 03:0...	Quality Assurance	Starting quality assurance check...
☆ 7 - Quality Assur...	<a href="#">connexions - 29811</a>	Provisioning	<a href="#">[blurred]</a>	11/04/2022 03:0...	Quality Assurance	All service checks completed for...
☆ 7 - Provisioning			<a href="#">[blurred]</a>	11/04/2022 03:0...	Provisioning	Provisioning items
☆ 7 - Provisioning	<a href="#">connexions - 29811</a>	Awaiting Member	<a href="#">[blurred]</a>	11/04/2022 03:0...	Provisioning	Your service has been configure...



## 4. Future developments



## Hybrid end-to-end automation

- Currently every-time a manual operation is needed the entire order is set to manual processing.
- We will improve OMS to pause when manual step/s are needed and restart when triggered by ENG-UI (OSS UI).







## Integration with IX-API

- IX-API can be integrated with the OMS with minimal modifications.
- All that is required is for IX-API to generate the same order inputs as Portal and OMS will handle the deployment the same way.
- This will standardise LINX users' experience ordering a service either via Portal or IX-API.







## Asynchronous order items processing

- Currently the order moves through the queues as a unit
- This prevents independent order items to be processed asynchronously
- Ideally independent order items should freely move through the queues, but this will require some additional redesign.



Thank you,  
any questions?



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