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Blockchain applications for telecoms

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HKT Here To Serve a PCCW Group member

Agenda

- Let's start with a use case: Ported-Numbers database
  - Disintermediation of 3rd party "top level orchestrators"
- Identity management (applicable for API security and more)
- Reputation (SLA, Financial)
- Bilateral, Multilateral, Omni-lateral DLTs
- Settlement automation
- Lifecycle automation
- Way Forward – CBC, DLT Based Supply-Chain Management

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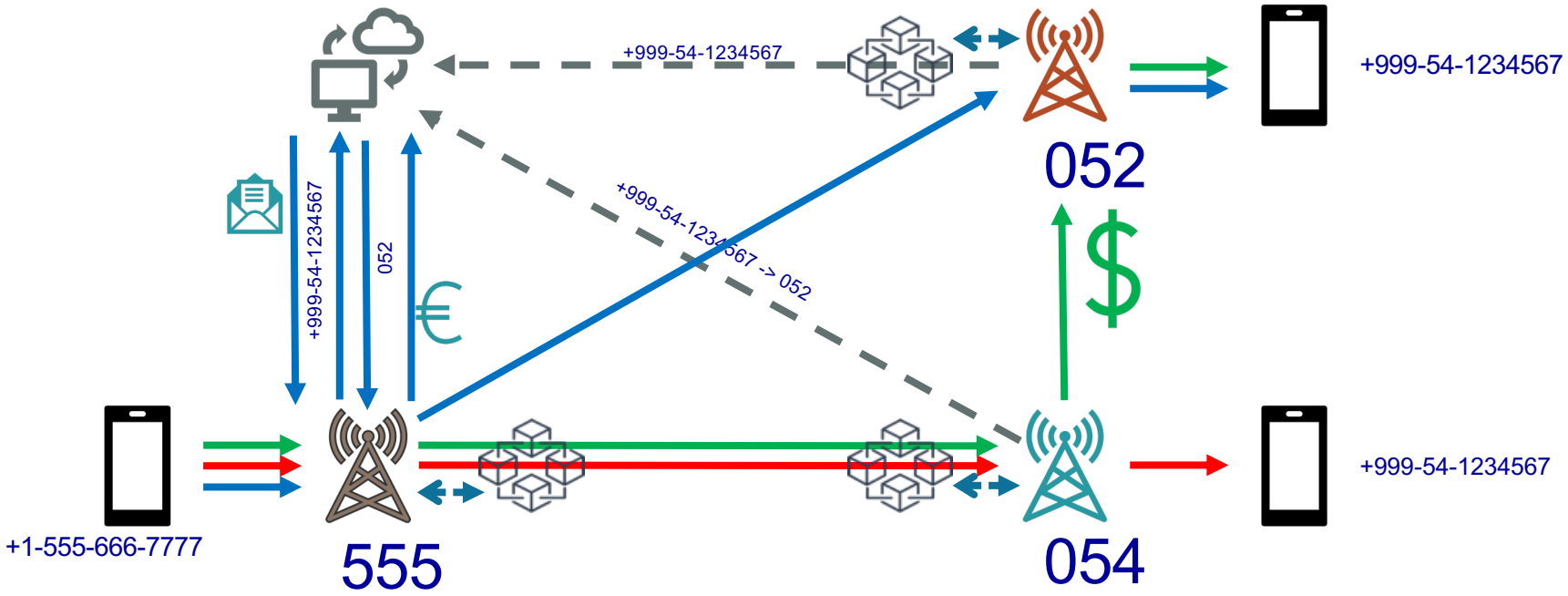
Ported Numbers



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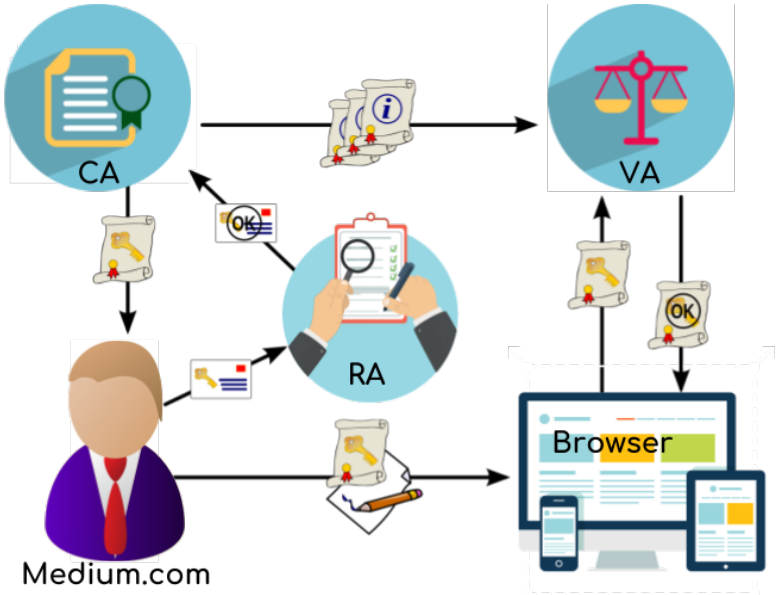
Identity Management: from X.509 PKIX to HPKP to DPKI

- Any of the ~1200+ CAs around the world can impersonate any website/web service.
- HTTP Public Key Pinning (HPKP) allows websites visitors to "pin" their public key for a period.

- RA = Registration Authority
- CA = Certification Authority
- VA = Verification Authority

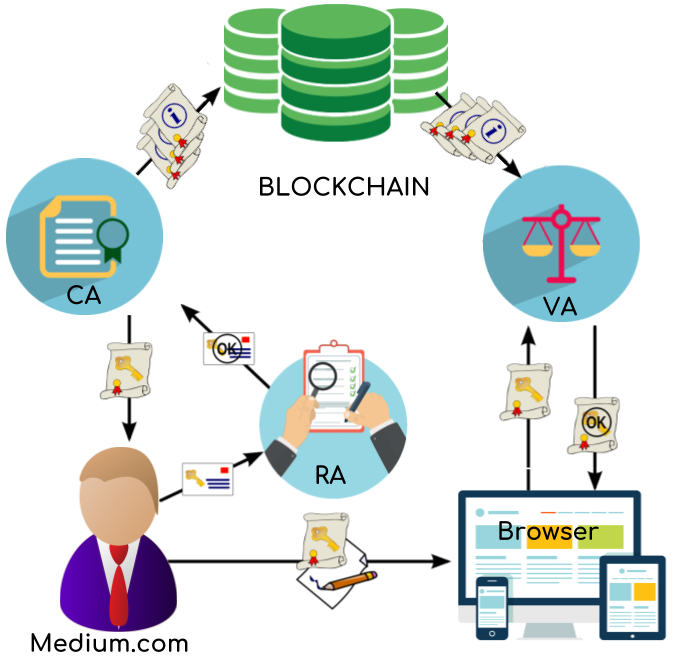


Identity Management: from X.509 PKIX to HPKP to DPKI

Decentralized Public Key Infrastructure (DPKI).

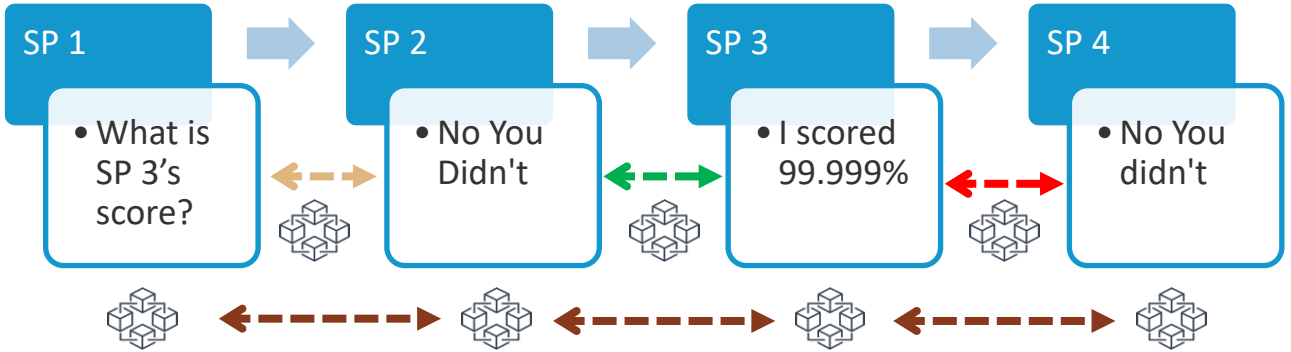
- No single third-party can compromise the integrity and security.
- “All-or-nothing forward progress”: either everyone witnesses everyone’s updates to their identifier/public-key or no one witnesses any updates.

- KYC = Know Your Customer
- DID = Decentralized Digital Identity



Reputation Management

- SLA Reputation



- Financial Reputation (i.e. Credit Score)
- POS Reputation – An asset used as "stake" in POS Consensus.
- Weighted Moving Average

$$WMA(t) = \frac{\sum_{j=0}^{n-1}(n-j)\,C(t-j)}{\sum_{i=1}^{n} i} \quad ; \quad Where\ n \geq 1$$

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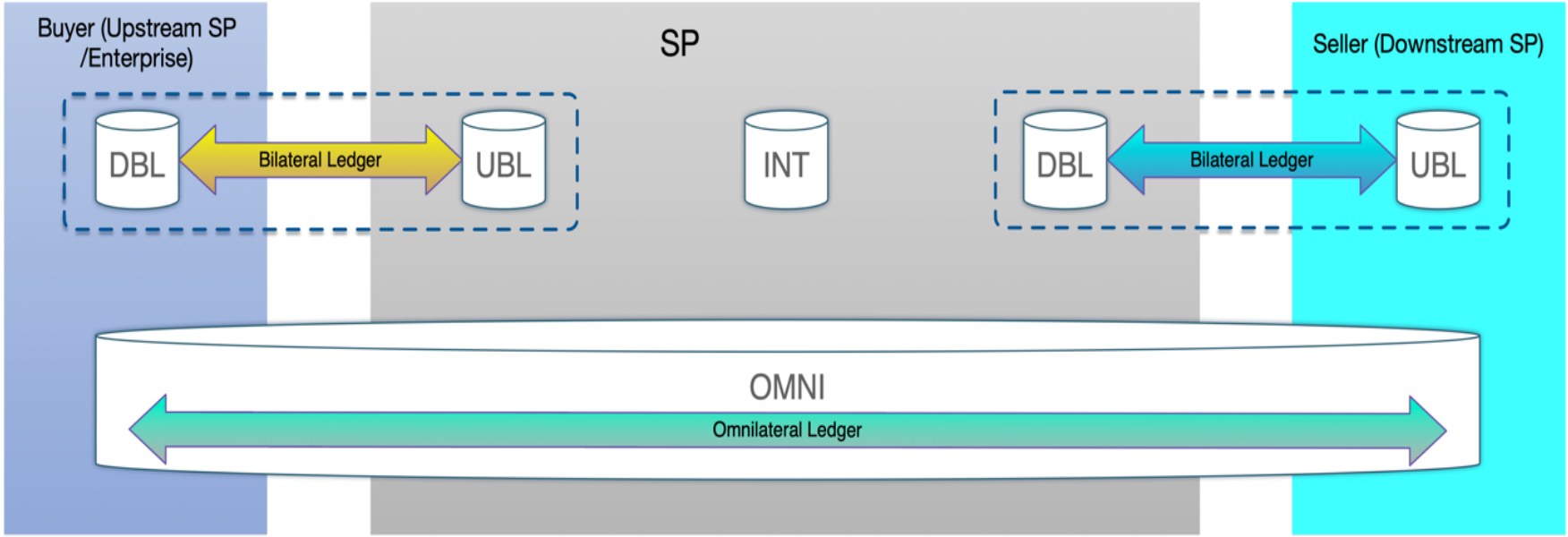
Bilateral, Multilateral, Omnilateral DLTs



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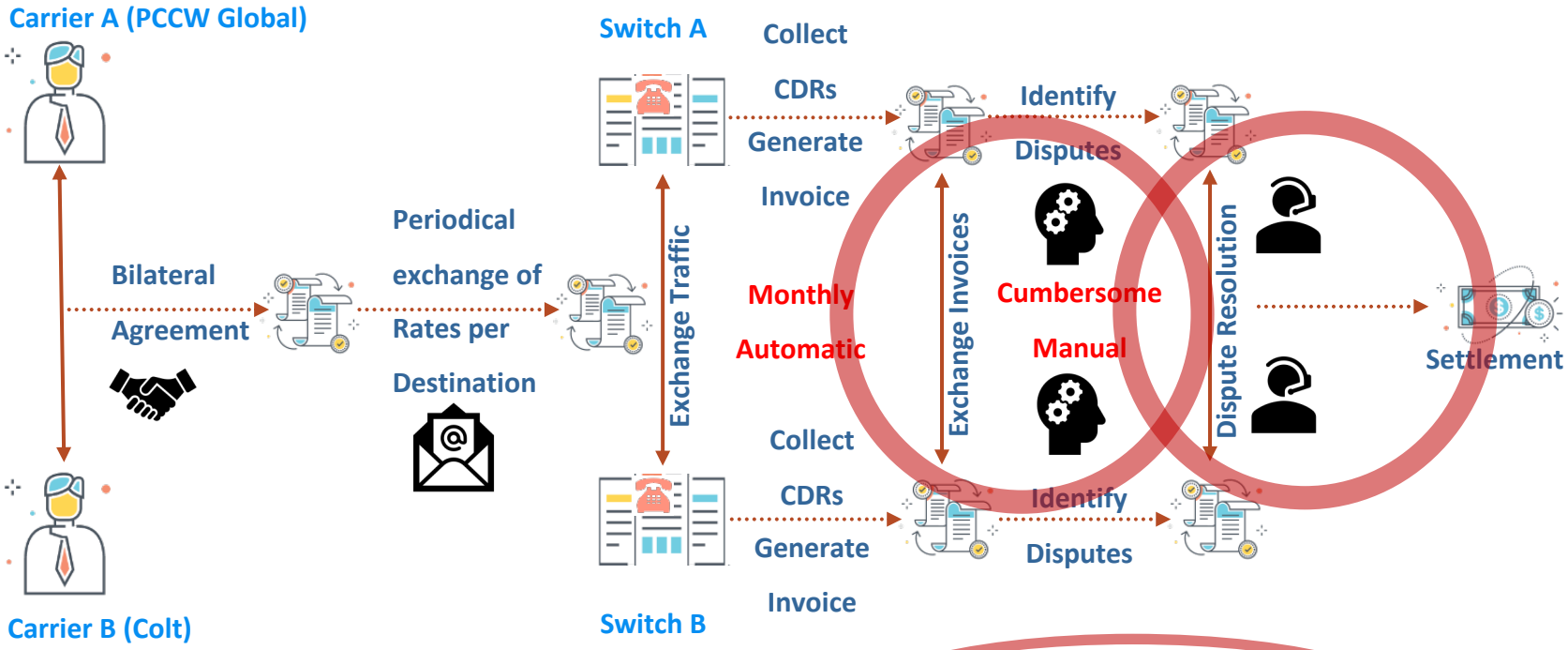
Legacy Wholesale Voice Settlement Process



Timeline	Month	4-6 Weeks	Weeks
HR Resources	5	6	8
Systems involved	3-4	3-4	2

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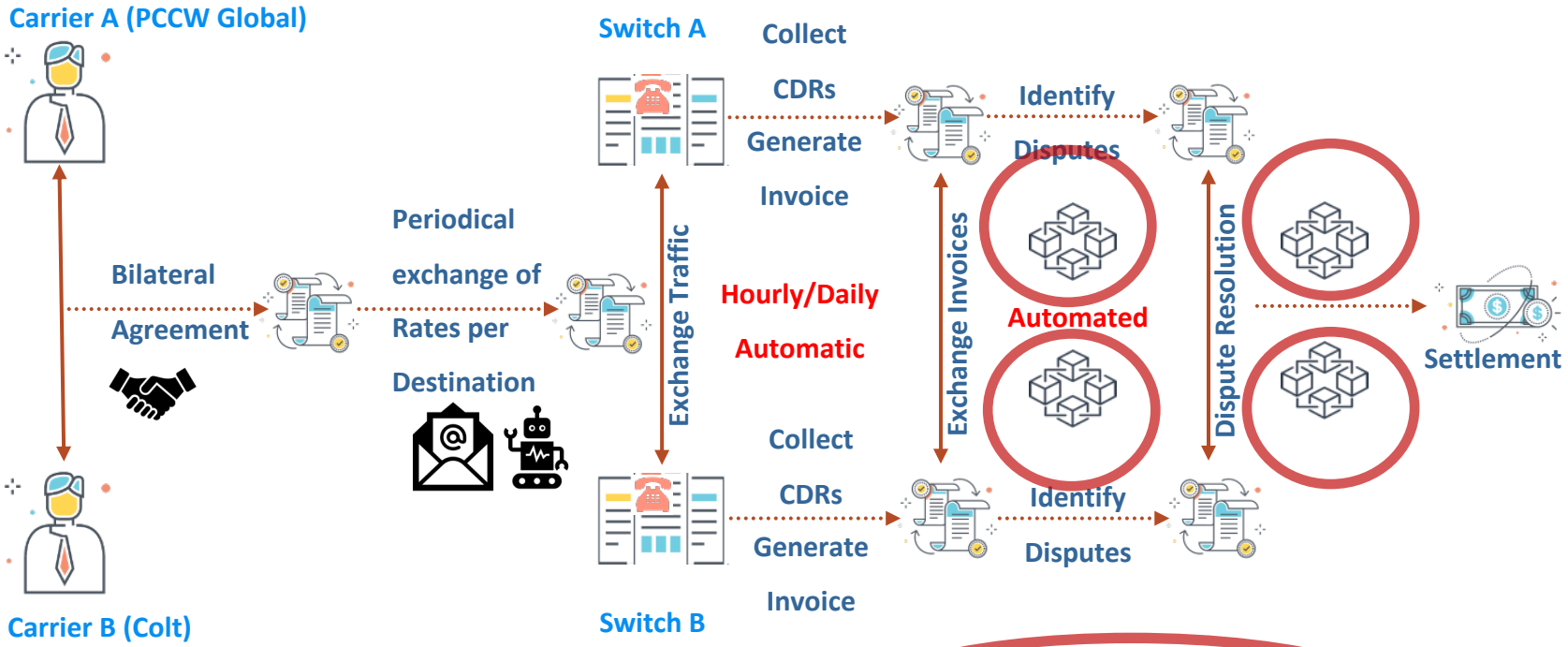
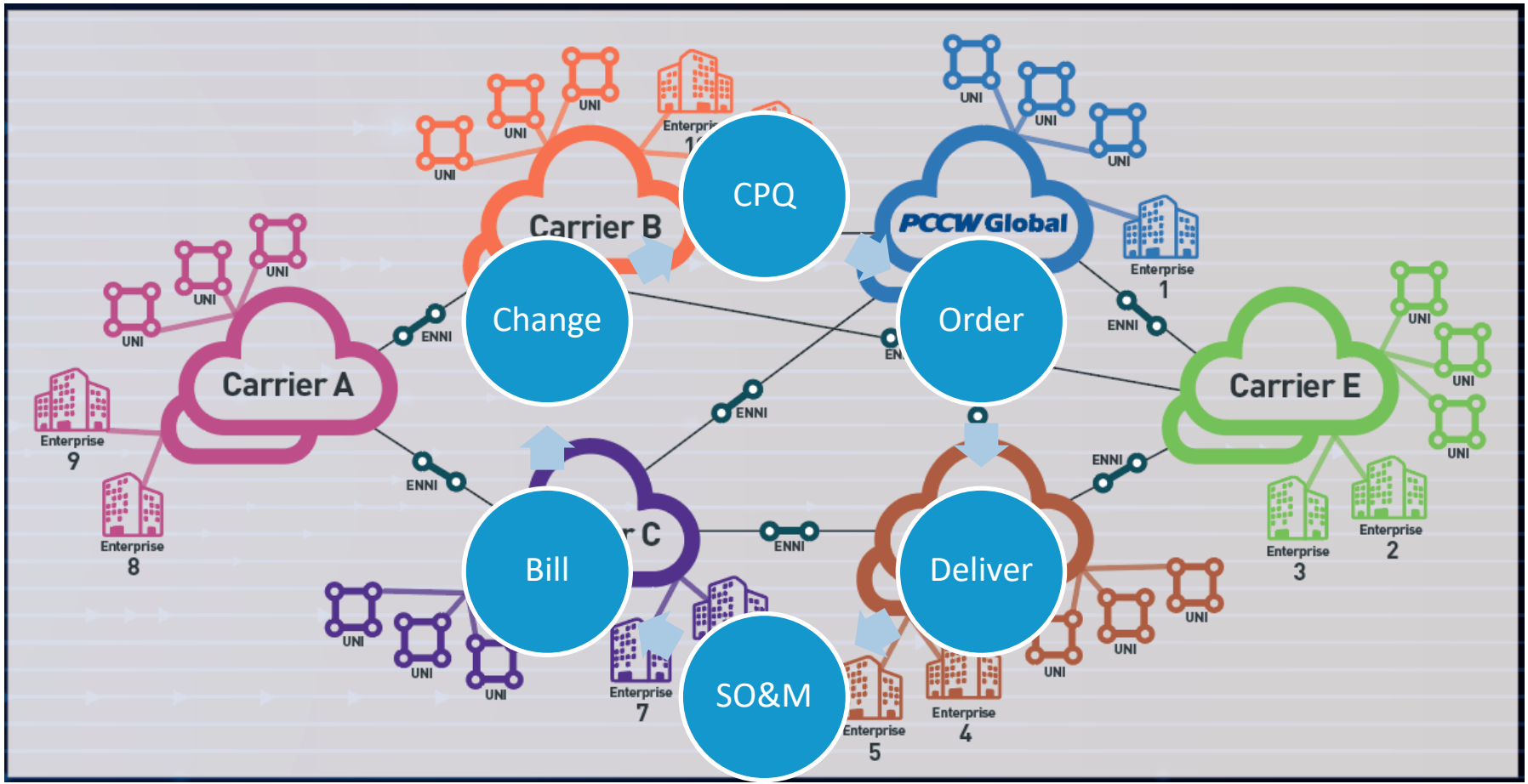
Automated Wholesale Voice Settlement Process



Timeline	Sub-Hourly	Minutes	Minutes
HR Resources	none	none	none
Systems involved	1		


CPQ
Change
Order
Bill
SO&M
Deliver
Carrier A
Carrier B
Carrier C
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Carrier E
ENNI
UNI
Enterprise 1
Enterprise 2
Enterprise 3
Enterprise 4
Enterprise 5
Enterprise 7
Enterprise 8
Enterprise 9

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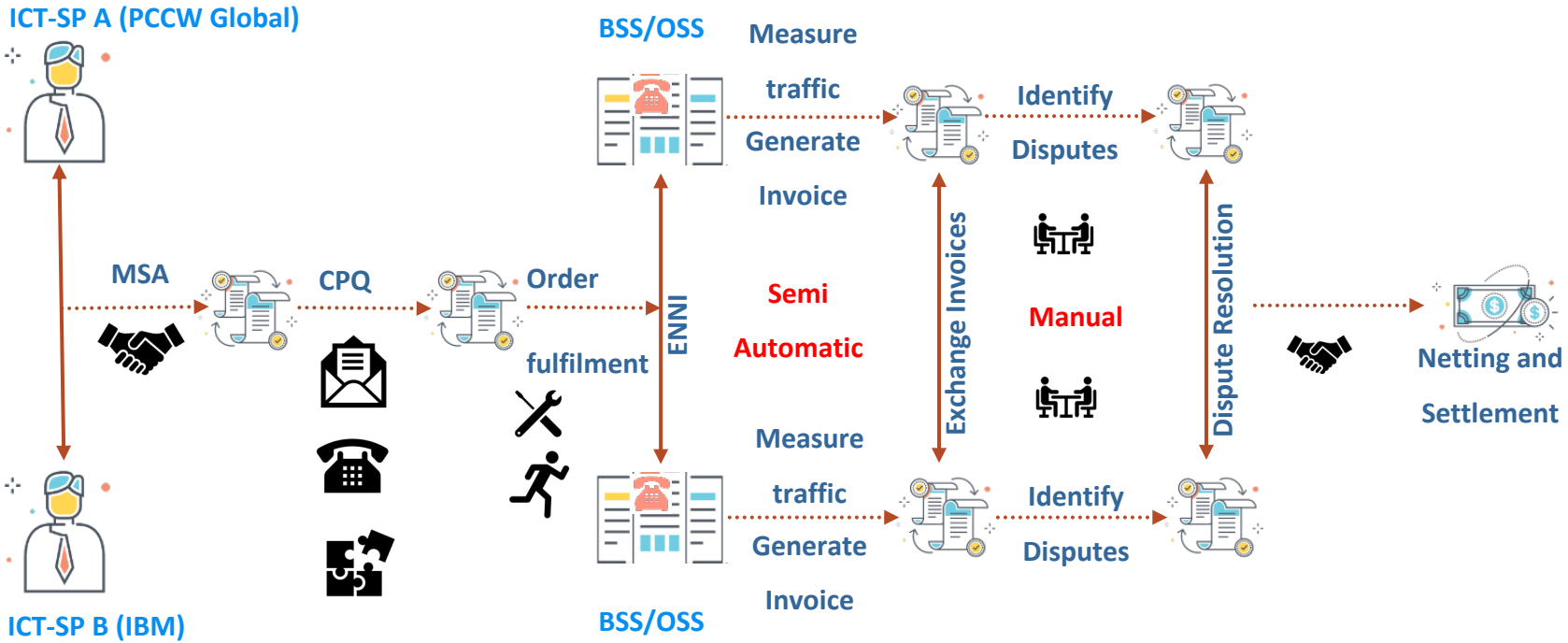
Legacy Wholesale Lifecycle and Settlement Process



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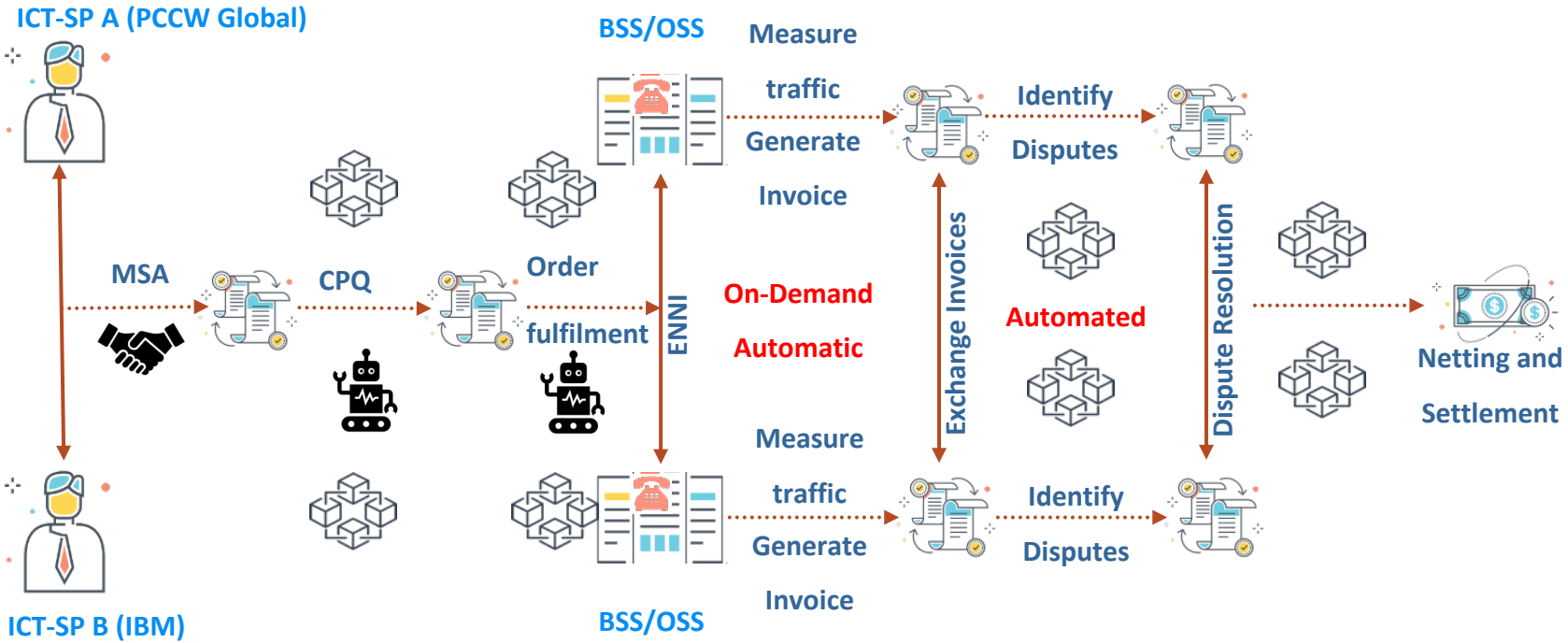
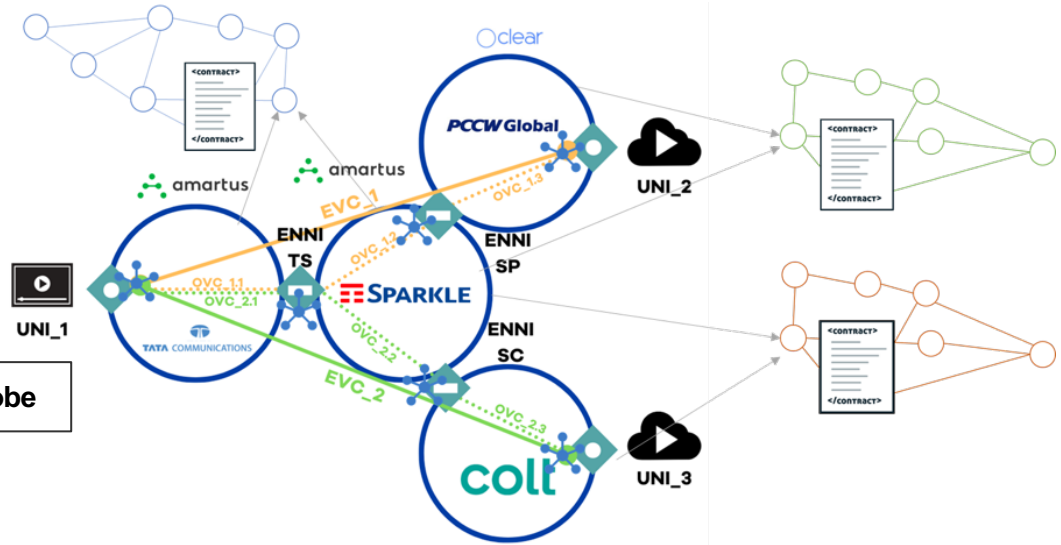
Automated Wholesale Data on-Demand Lifecycle and Settlement Process



Timeline	7-30 dsyd -> Seconds	Months -> Minutes	Days -> Seconds	Months - > Seconds	Weeks -> Seconds
HR	5-10 -> None	10 -> None	2 -> None	4 -> None	8 -> None

MEF19 MEF 3.0 POC: Multi-Domain Data-on-Demand

Order placement and link activation



Service	Order flow	Capabilities shown in the MEF 3.0 PoC
EVC	Customer order's a 10 Mbps E-Line service online between Hong Kong and NY	Customer Portal (TATA- Console Connect Web Portal)
OVC_1.1	Order UNI_1 to ENNI TS on Tata	OVC_1.1 on Tata + Order on Sparkle using Sonata API / DLT (Amartus)
OVC_1.2	Order ENNI TS to ENNI SP on Sparkle	OVC_1.2 on Sparkle + Order on Sparkle using Sonata API/DLT (Clear + Amartus)
OVC_1.3	ENNI SP to UNI_2 on PCCWG	OVC_1.3 on PCCWG using Console Connect Portal + pass downstream order to Sparkle (PCCWG + Clear)
SETTLEMENT	Billing & digital settlement for this order on Hourly basis	Blockchain (Amartus + Clear)

Key Learnings (Blockchain related)

Beware of vendor-lock-in.

Abstract DLT from Application.

Every application should run on every DLT

The vendors won't like it, it may slow things down, but you won't regret the decision.

DLT is not a panacea.

Throwing blockchain at a problem won't solve it.

It is useful for **multi-party appliations**.

It is a trust-worthy source of truth in absence of a top-level intermediator.

Cost-Saving is a bad business case.

The competitor can save just as much. Avoid race to zero.

Cost of project needs to be covered.

See where use of Blockchain can yield **new revenue streams.**

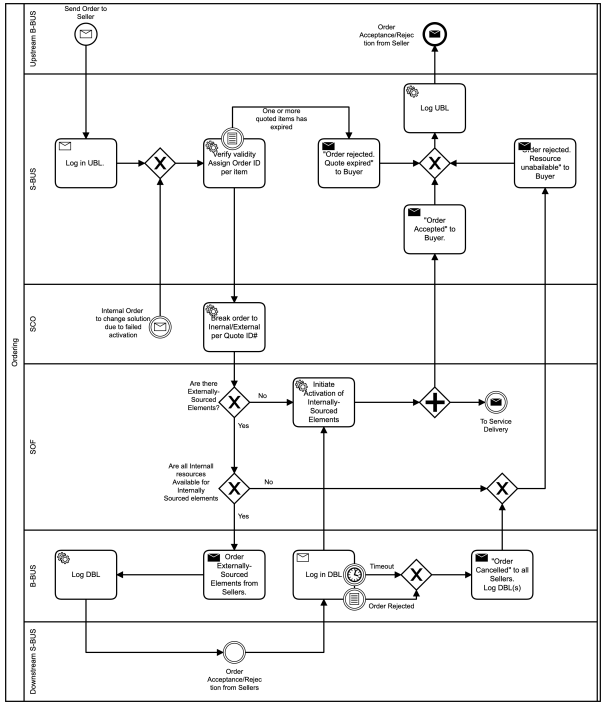
Blockchain is just one step in the Digital Transformation journey

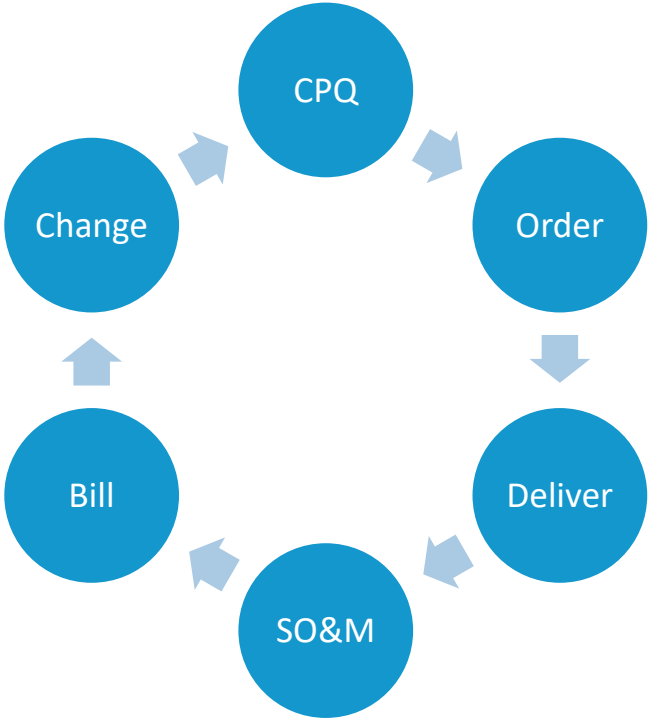
Cultural change required.

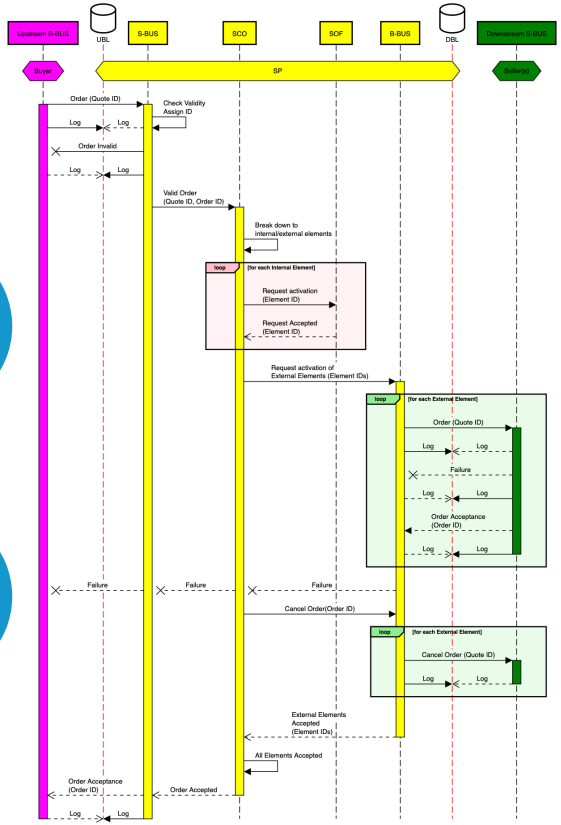
Software Development, Shift of Focus.

Driven by Management.

Service Lifecycle Automation



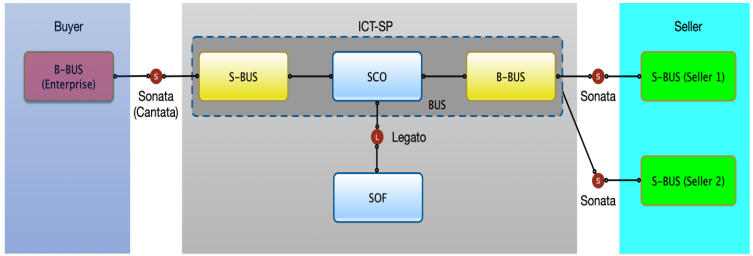




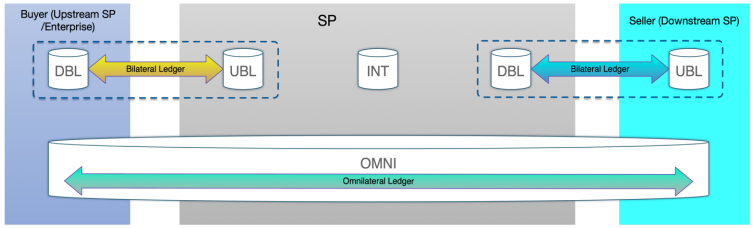
DLT-Based Commercial and Operational Framework for Automated Data-on-Demand Services

DLT-Based Commercial and Operational Framework for Automated Data-on-Demand Services

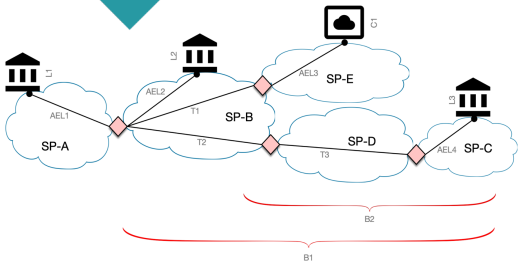
Reference Architecture

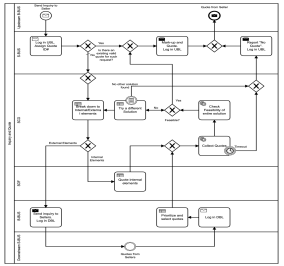


DLT Architecture



Use Cases



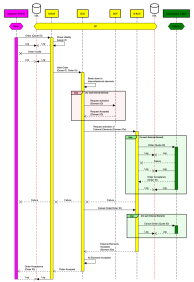


Process Flows (BPMN)

SLA Reputation

$$WMA(t) = \frac{\sum_{j=0}^{n-1}(n-j)\,C(t-j)}{\sum_{i=1}^{n} i} \quad ; \quad Where\ n \geq 1$$

Info Flows



Thank you

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