

From Smart IP Delivery to Smart Contract : Core Store a Myth?

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Outline

- **Smart Delivery**
- **Core Store & Corporate IP Management**
- **Smart Contract**

Smart Delivery Objectives

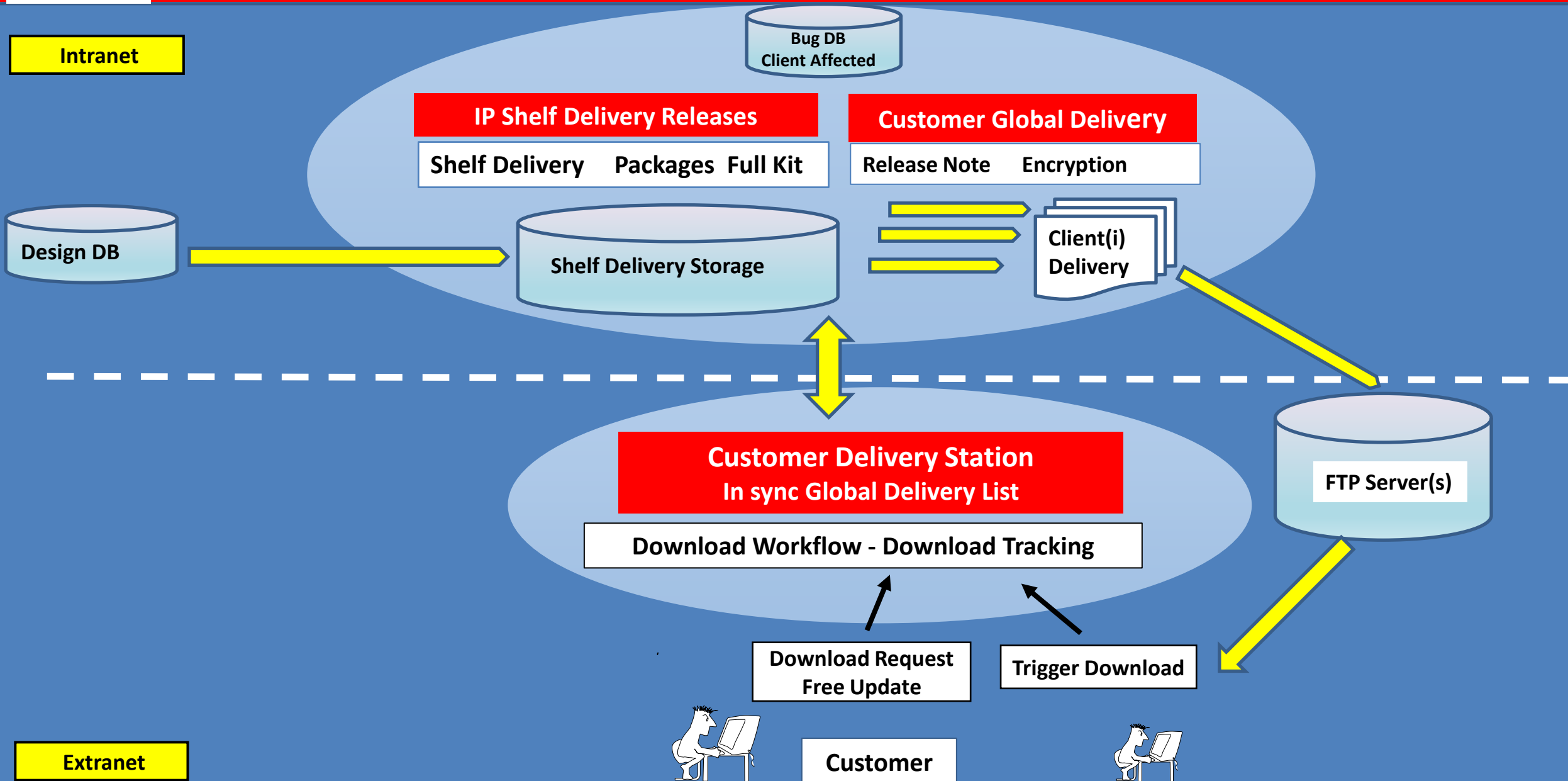
- **IP Delivery can be a tricky process**
 - Large portfolio of IP with complex Directory
 - Delivered on a large number of process nodes
 - Delivered to a (large) number of worldwide client
 - Under diversified Business models
- **High support requirement**
 - Numerous patches /tuning/optimization
 - Which files sent to whom?
 - Which customer to be alerted and upgraded ?
 - Which bug affects which client ?
- **High level security needed**
 - *Intellectual Property* Exchange
- **Need an integrated extensible *next generation* solution (Web **x.0** , uberization..)**
 - Configurable Fast and Secure Delivery
 - Extended to Core Store or to collaborative IP based design ?
 - Up to Smart Contracting?

Innovative Secure Duplex Infrastructure

Two Synchronized IPMS tm platforms: Why ?

- **In Intranet** :IP Files collection and packaging (IP Shelf Delivery Release)
 - Performed in intranet - Bridge between Designer and Delivery manager
 - Secure Private Delivery Storage - No customer access
 - All Delivery tagged , archived ,encrypted and sent to ftp server (s)
- **In Extranet :Customer access**
 - Synchronized with the IP Shelf Delivery Station
 - Controls delivery process : worldwide transfer of large files
 - Secure Customer access
 - *Tracking and reporting*
- **Innovation based on IPMS tm features**
 - Synchronization between both stations
 - Extensible , Configurable Features (XML configurable format on top of a DB)
 - Unlimited and Easy Extension
 - Support (Bug) , Fee collection (smart contract)....

Smart IP Delivery Station



Outline

– Smart Delivery

- *Shelf Delivery Station*
- Customer Delivery Station

– *Core Store & Corporate IP Management*

– Smart Contract

IP Shelf Delivery - Key ingredient


What is an IP Shelf Delivery Release ?

- Released, non modifiable IP version/configuration "customer ready"
- ❖ **Interface between the Design world and the Delivery world**

Key items

- Documentation (configurable format)
- Identifier and Type
- Part Number for Customer - "Private "IP Release ID" - Refined to "Shelf Delivery ID" -Date stamp (many fixes)**

Product Name	SST ESF3-55 SuperFlash 128K x 72 Bits Flash IP
Part Number	pfm_355gf128kx72_v1
Release ID	v1 c2

Product Identification		Delivery Content		Delivery Files	
IP Identifier ▲▼	Deliverable Type	Shelf Delivery Release		Zipped Delivery File full for Foundry	Reduced Zip for Custom
pfm_355gf128kx72_v1 v1c2	Design Kit	DESIGNKIT_pfm_355gf128kx72_v1c2_20180425		DESIGNKIT_pfm_355gf128kx72_v1c2_20180326.tgz (Refresh)	DESIGNKIT_pfm_355gf128kx72_v1c2 (Refresh)
pfm_355gf128kx72_v1 v1c2	Merge Kit	MERGEKIT_pfm_355gf128kx72_v1c2_2018032		MERGEKIT_pfm_355gf128kx72_v1c2_20180326.tgz (Refresh)	N/A
pfm_355gf128kx72_v1 v1c2	Design Kit	DESIGNKIT_pfm_355gf128kx72_v1c2_20180705 		download_566_DESIGNKITS_pfm_355gf128kx72_v1c2_20180705.tgz (Refresh)	download_566_DESIGNKITS_pfm_355gf128kx72_v (Refresh)

Delivery Types

- Basic Shelf Delivery
- Generic (Reusable) Package
- Customer specific Package of Shelf Delivery
- Full Custom (Script based Delivery generation for complex delivery) - not Shelf Delivery based

The screenshot shows a web application interface for delivery management. At the top, there is a navigation bar with three tabs: 'Enter Data', 'Report', and 'Delivery Report'. The 'Enter Data' tab is currently selected. Below the navigation bar, there is a sidebar on the left with three menu items: 'Enter Bug', 'Enter Delivery', and 'Enter Product'. The 'Enter Delivery' menu item is highlighted. The main content area is titled 'Select a Function'. It contains two sections. The first section is titled 'Enter Shelf Delivery' and contains two buttons: 'Add Shelf Delivery' and 'Add Generic Package'. The second section is titled 'Enter Customer Delivery' and contains two buttons: 'Add Customer Specific Package' and 'Add Full Custom Delivery'.

Enter Bug	Enter Delivery	Enter Product
Enter Data	Report	Delivery Report

Select a Function

Enter Shelf Delivery


- Add Shelf Delivery
- Add Generic Package

Enter Customer Delivery

- Add Customer Specific Package
- Add Full Custom Delivery


Generic Package versus Customer Specific

- Composition of Basic Shelf Delivery : Design Kit (pfm and Bias) or Merge KIT (pfm and Bias) or both
- Identifiers and content automatically reported
- Package Type



Creation Date ▲▼	Delivery ID	IP Identifier	Package Type ▲▼	Package Identifier ▲▼	Shelf Delivery Release	Global Delivery
2016-12-01	PACK4	pfm_355gf32kx72_v1 v1a2	Typical IP engagement ▼	DK_pfm_20161109-DK_bias_20161130	DESIGNKIT_pfm_355gf32kx72_v1a2_20161109 DESIGNKIT_bias_355gf32kx72_v1a2_20161130	Upload
2016-11-30	PACK3	pfm_355gf32kx72_v1 v1a2	Mask Shop ▼	MK_pfm_20161121-MK_bias_20161121	MERGEKIT_pfm_355gf32kx72_v1a2_20161121 MERGEKIT_bias_355gf32kx72_v1a2_20161121	Upload
2016-12-12	PACK5	pfm_355gf32kx72_v1 v1a2	Custom IP engagement ▼	MK_bias_20161121-DK_bias_20161130-MK_pfm_20161121-DK_pfm_20161109	MERGEKIT_bias_355gf32kx72_v1a2_20161121 DESIGNKIT_bias_355gf32kx72_v1a2_20161130 MERGEKIT_pfm_355gf32kx72_v1a2_20161121 DESIGNKIT_pfm_355gf32kx72_v1a2_20161109	Upload

- Customer Specific (Customer attribute)



Creation Date ▲▼	Customer Name ▲▼	Delivery ID ▲▼	Customer Attribute	Package Identifier	Shelf Delivery Release ▲▼	IP Identifier	Global Delivery
2016-12-23	Client1	Company1-20161223	Beta	MK_pfm_20161121-MK_bias_20161121	MERGEKIT_pfm_355gf32kx72_v1a2_20161121 MERGEKIT_bias_355gf32kx72_v1a2_20161121	pfm 355gf32kx72 v1 v1a2 pfm 355gf32kx72 v1 v1a2	Upload
2017-01-10	Client2	Company2-20170110	Foundry	DK_pfm_20161109-DK_bias_20161130	DESIGNKIT_pfm_355gf32kx72_v1a2_20161109 DESIGNKIT_bias_355gf32kx72_v1a2_20161130	pfm 355gf32kx72 v1 v1a2 pfm 355gf32kx72 v1 v1a2	Upload

Create a client Delivery on a ftp server

- Identifying server ,downloader FTP access data

Ftp Server

Add New Ftp ServerFtp Server List

Authorized Downloader

Add New Authorized Downloader

Assign ServerAssignment List

Authorized Downloader List

Customer Delivery

Add New DeliveryDelivery List on FTP Server

IP Identifier ▲▼	Delivery Type	Shelf Delivery Release	Generate Global Delivery	Encryption Key Name	Ftp Server Name	On Which Server	Send to FTP
pfm_355gf128kx72_v1 v1c2	Generic Package	DESIGNKIT_bias_355gf32kx72_v1a4_20190125 DESIGNKIT_pfm_355gf128kx72_v1c2_20180705 ⚠	<div>Generate</div> client2_DK_bias_20190125-DK_pfm_20180705.tgz (View Content)	Symmetric	94.23.53.128 ▼	On Which Server	<div>Send</div>
pfm_355gf128kx72_v1 v1c2	Generic Package	DESIGNKIT_bias_355gf32kx72_v1a4_20190125 DESIGNKIT_pfm_355gf128kx72_v1c2_20180705 ⚠	<div>Generate</div> client1_pfm_355gf128kx72_v1_20190221.tgz (View Content)	Symmetric	94.23.53.128 ▼	On Which Server	<div>Send</div>

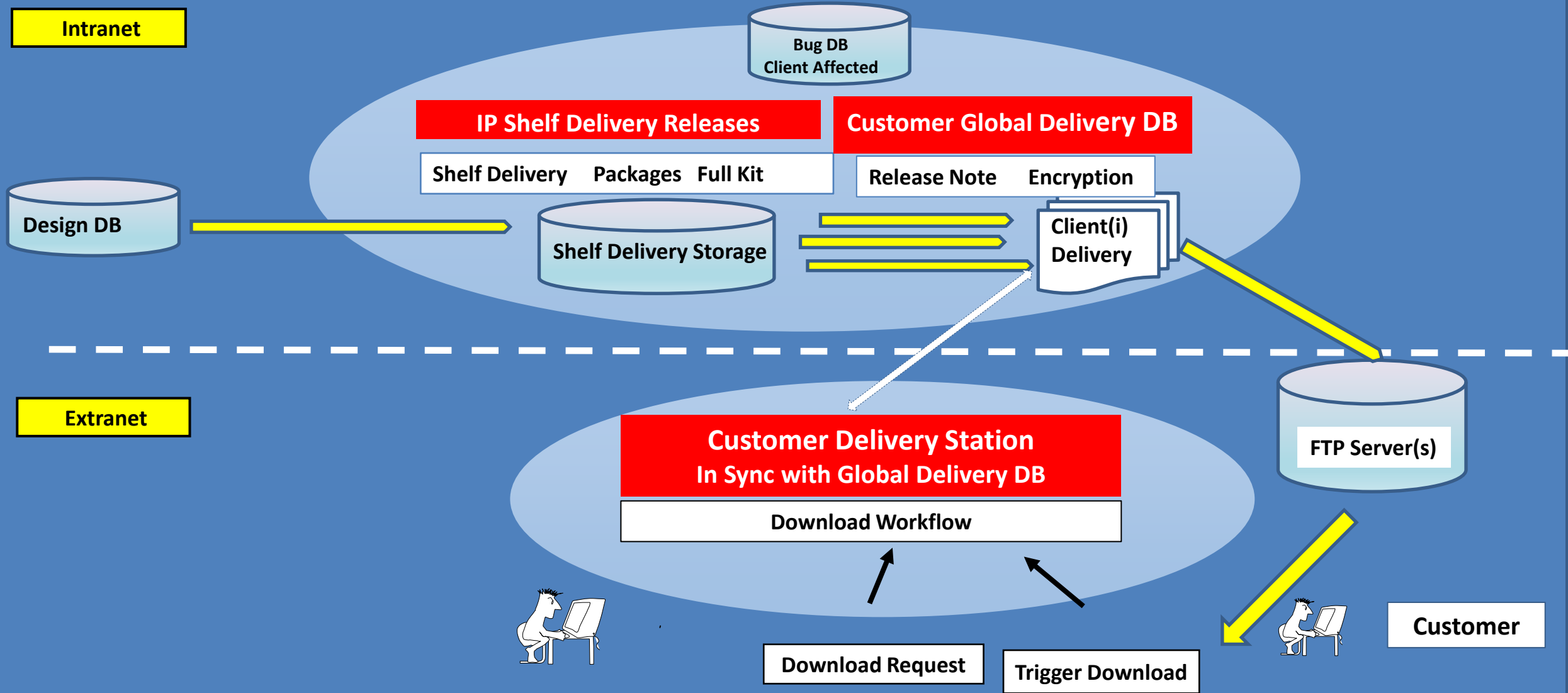
Outline

– Smart Delivery

- Shelf Delivery Station
- *Customer Delivery Station*

– *Core Store & Corporate IP Management*

– Smart Contract











Customer Delivery Station

- Delivery List Synchronized with the Shelf Delivery station

Download Request	Downloader Identification	Target Product			B		
Delivery ID	User Email	IP Identifier	Delivery Type	Delivery Content ID	Generate Global Delivery	Encrypted	Encry
Client2_2019-02-25	user@client2.com	pfm_355gf128kx72_v1 v1c2	Generic Package	PACK20	client2_DK_bias_20190125-DK_pfm_20180705.tgz	Yes	client2_DK_bias_20190125
Client1_2019-02-01	user@client1.com	pfm_355gf128kx72_v1 v1c2	Generic Package	PACK20	client1_pfm_355gf128kx72_v1_20190221.tgz	No	client1_pfm_355gf128k
SST_2019-02-26	Ranga.Srinivasan@microchip.com	pfm_355gf128kx72_v1 v1c2	Generic Package	PACK19	sst_pfm_355gf128kx72_v1_20190225.tgz	Yes	sst_pfm_355gf128kx7

- Open to Client: Customer Download Workflow



Download Request	Downloader Identification	Delivery Options		Alert client				IP Delivery	
Delivery ID	User Email	Limited Duration	NO of Hours	Approver1	Approver2	Approval Date	Download Authorized	IP Download	Client CheckSum Status
Client2_2019-02-25	user@client2.com	No <input type="text"/>	0 <input type="text"/>	 Deny	 Deny	2019-03-11 10:49:28		 Download	UNKNOWN <input type="text"/>
SST_2019-02-26	ranga.srinivasan@microchip.com	No <input type="text"/>	0 <input type="text"/>	 Deny	 Deny	2019-03-04 10:29:18		 Download	PASSED <input type="text"/>

- Download tracking & Report

Easy Extension to Unlimited key features

- Synchronized with a shelf delivery centric Bug DB . Alert when creating delivery

Which Bug			Which Product		Affected Customers
Bug ID	Bug Criticality	Bug Status	IP Identifier	Shelf Delivery Release	Customer Name
Bug1	Critical	New	pfm_355gf128lx72_v1 v1c2	DESIGNKIT_pfm_355gf128lx72_v1c2_20180705	SST SST Client1 Client2

Delivery Content		
Package Type ▲▼	Package Identifier ▲▼	Shelf Delivery Release
Typical IP engagement ▼	DK_pfm_20180705-MK_pfm_2018032	DESIGNKIT_pfm_355gf128lx72_v1c2_20180705 MERGEKIT_pfm_355gf128lx72_v1c2_2018032 
Typical IP engagement ▼	DK_bias_20190125-DK_pfm_20180705	DESIGNKIT_bias_355gf32lx72_v1a4_20190125 DESIGNKIT_pfm_355gf128lx72_v1c2_20180705 

- New Shelf Delivery Alert to Client Groups
- Free Upgrade periodand more

General Description				License Duration	IP Upgrade		
License Agreement	License Agreement Number	Customer Name	Part Number ▲▼	License Effective Date	Free Upgrade	Upgrade Limit	Upgrade Authorized
Client1	Client 2019	Client1	pfm_355gf96lx36_v1	2016-11-01	Limited Duration	2018-11-01	No

2018 Best User of IPMS™

“We had been looking at different solutions to improve the IP release flow to our customers .

We were immediately interested in the tool as it addressed our requirements, including a web-based user interface, bug reporting capability, packaging and delivery combined solution, security, and customizable features for added flexibility. Our experience with Gabriele’s team has been very positive once we started working out the implementation details. In short, we are very happy with the collaboration between SST and D&R and with the results.”

Pascal Adam SST Product Marketing Manager
SST Licensing Division

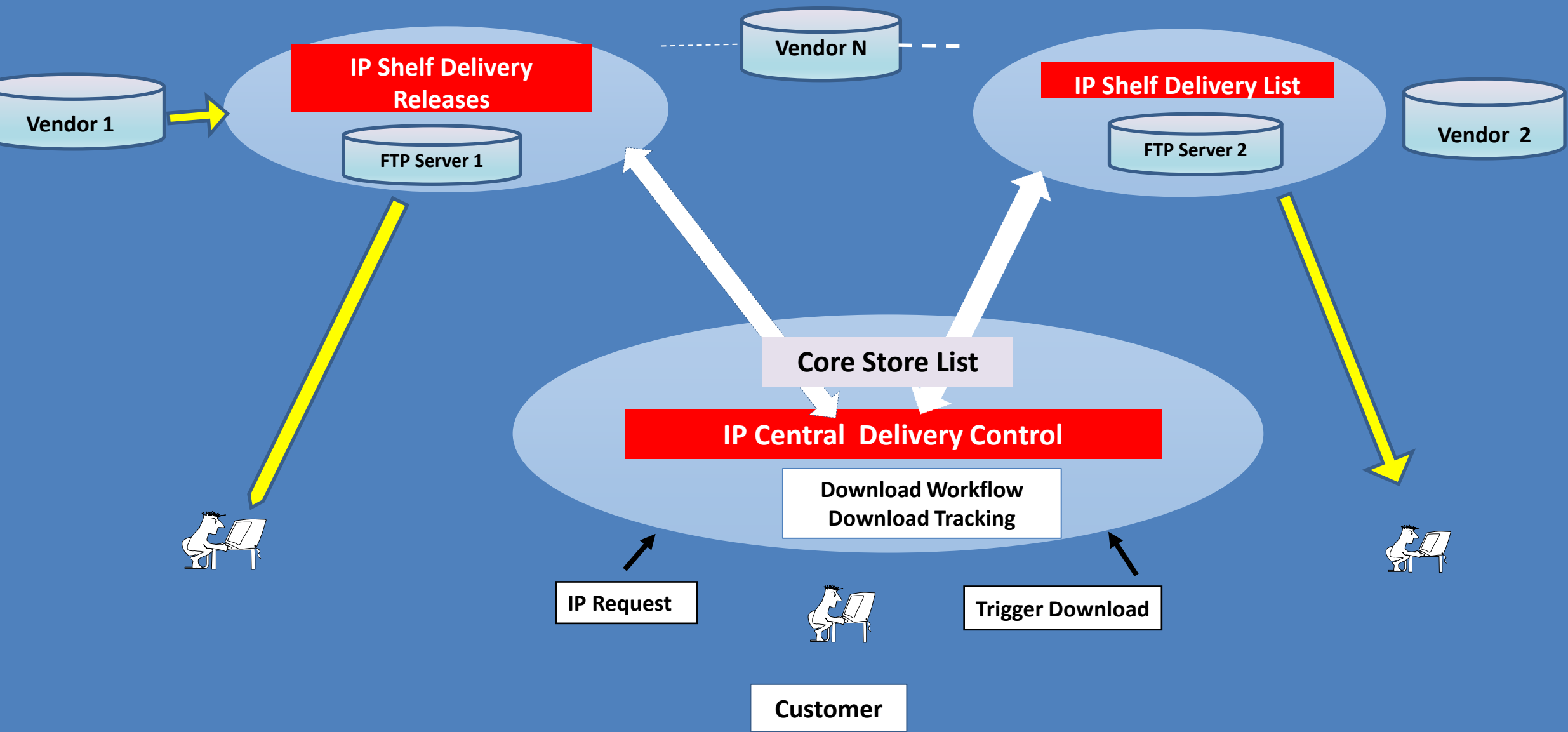
Outline

- **Smart Delivery**
- ***Core Store & Corporate IP Management***
- **Smart Contract**

Core Store: Why?

- Why?
 - An Ecosystem ?
 - Vendor / consumer community/Consortium ? IP democratization?
 - **Cluster of IP providers**
 - Design Market Place
- Independent vendors sharing
 - Technical target (FDSOI IP shop ...)
 - Product centric (RISC V Consortium..) or Platform Centric
- Benefit
 - Advanced Distribution infrastructure for **easier client access**
 - Shared marketing and **more powerful visibility and Branding**
 - Possibly share “**Smart contract**” and Legal protection (more trust for both parties)
 - No intrusion in business model or negotiation of each vendor

Core Store Infrastructure



IPMS tm Turnkey (multi vendor) Core Store secure Implementation

Vendor **privately** negotiates with its customers terms and conditions

For each delivery transaction

- The provider to make visible the delivery in its list of available delivery on its ftp server
- Delivery listed in the Customer Station
- Client alerted that a delivery is ready
- Provider to deliver the final authorization in the delivery workflow
- Client to download from the Delivery station

Download tracked and controlled

- ***Confidential access per vendor***
- ***No intrusion in business***

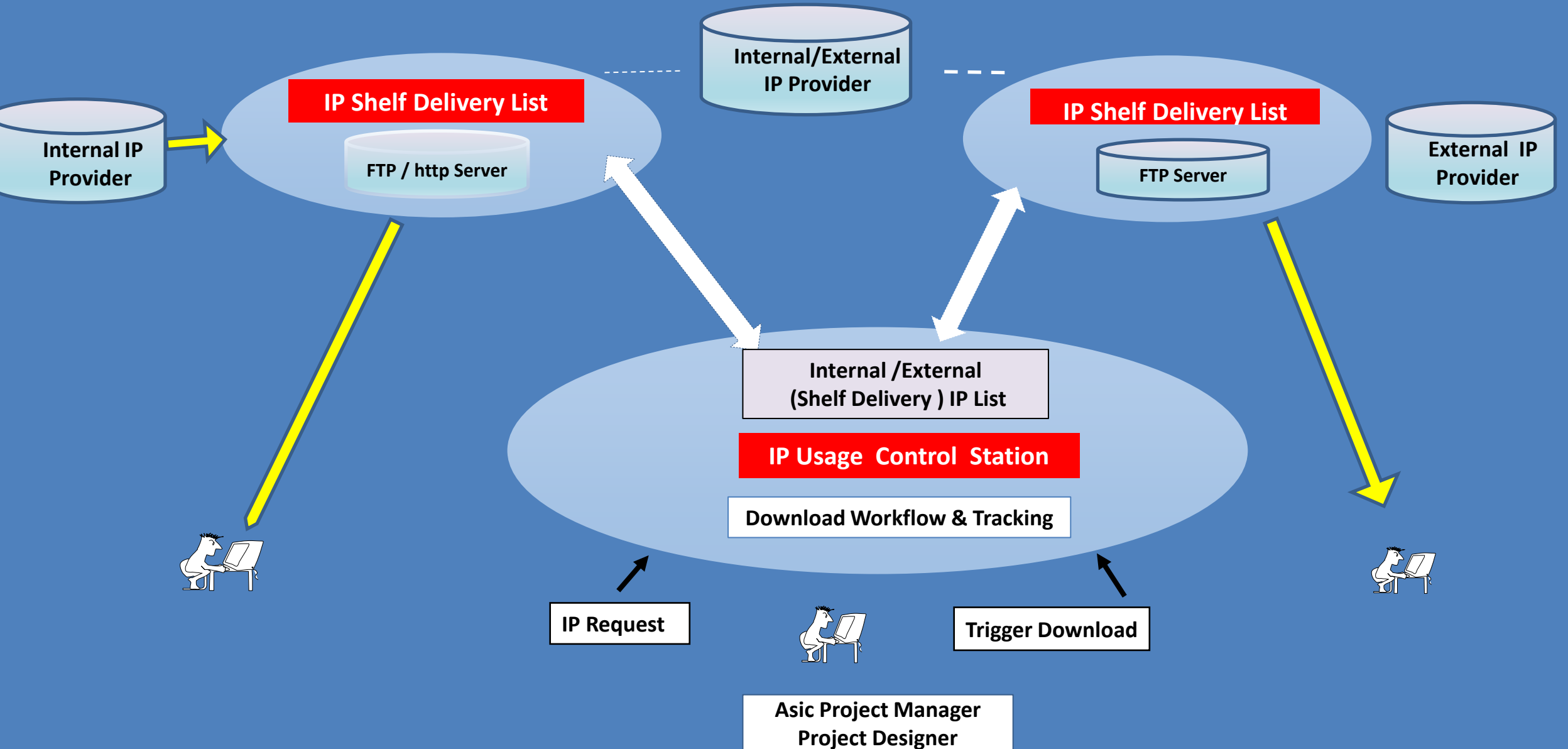
Corporate External and Internal IP Management :A myth?

- Similar Need: Which IP release in which product release :Tracing needed ...

Solution

- Handle internal IP with the same delivery control as external IP
- “IP shelf delivery releases” identified and accessible
- IP Usage Control Station:
 - Controlled IP Download from server(s) by internal design team
 - Trigger download from the “**IP Usage Control station**”
- IPMS tm offers a Turnkey Infrastructure for External and Internal IP management
 - Automated IP Tracing: which IP release used in which project
 - Alert for New Release and new Bug

Corporate IP managemet :IP Tracing or Where used?



Outline

- **Smart Delivery**
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Smart Contract

- IP Democratization statement

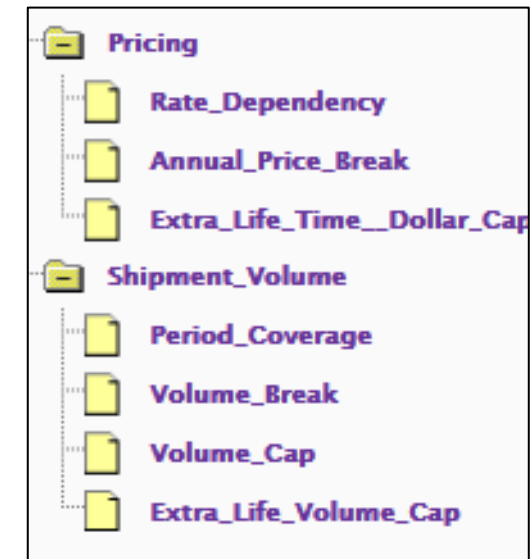
“No one wants to spend months negotiating license terms under today's cost and time-to-market pressures”

- Licensing template (VSIA history..?)

- Focus on Payment Due (NRE ,License Fee ,Maintenance , Royalty)
 - Special interest in royalty
 - Royalty Payment (possibly license Free IP for some IP) may become attractive in the future for fast negotiation
 - Pay per Use.. **Pay per Success** ... With high income for large series
- **Smart Contract ?**
 - **“Computerized transaction protocol that executes the terms of a contract”**
 - **Royalty Engine?**
 -

What is a Royalty Engine ?

- Based on
 - the abstraction of the (diversified) legal agreements
- Extensible Library of (reusable) Royalty functions
 - Input
 - Pricing parameters
 - Tracing or “where Used” Data
 - Shipment Volume Parameter
- Royalty Function
 - Outputs the royalty price to be paid per IP/SoC per quarter /year



Unique comprehensive Royalty function library

- IPMS tm Royalty Engine a Key asset

Royalty Function agreed - Customer reports to Vendor

IP License Agreement

Fee

Royalty

IP Usage Report

Registration

Format

Upload

Listing

By Client

Royalty Library

Format

Upload

Listing

IP Business Terms

Upload

Listing

Royalty Report

Registration

Format

Upload

Listing

By Client

Display Filter

		Customer	Which IP	Royalty Parameters	Product Volumes			
		Customer Name	Product Name	Template Name	Q1 Volume	Q2 Volume	Q3 Volume	Q4 Volume
Edit		BroadCom	Dual Port, Low Voltage, GF 55LPx with Embedded Flash, HVt & SVt, SRAM Memory Compiler	Annual Volume Cap – IP Centric	20,000.00000	25,000.00000	15,000.00000	10,000.00000
Edit		Intel	Single Port, Low Voltage, GF 28SSLP, HVt & SVt, Register File Compiler	ASP – Annual Volume Cap – IP Centric	15,000.00000	15,000.00000	20,000.00000	15,000.00000
Edit		Samsung	Single Port, Low Voltage, GF 55LPx with Embedded Flash, HVt & SVt, Register File Compiler	Annual Price Break	10,000.00000	15,000.00000	20,000.00000	15,000.00000
				Total :	45,000	55,000	55,000	40,000

Extensible Largest library of Royalty functions

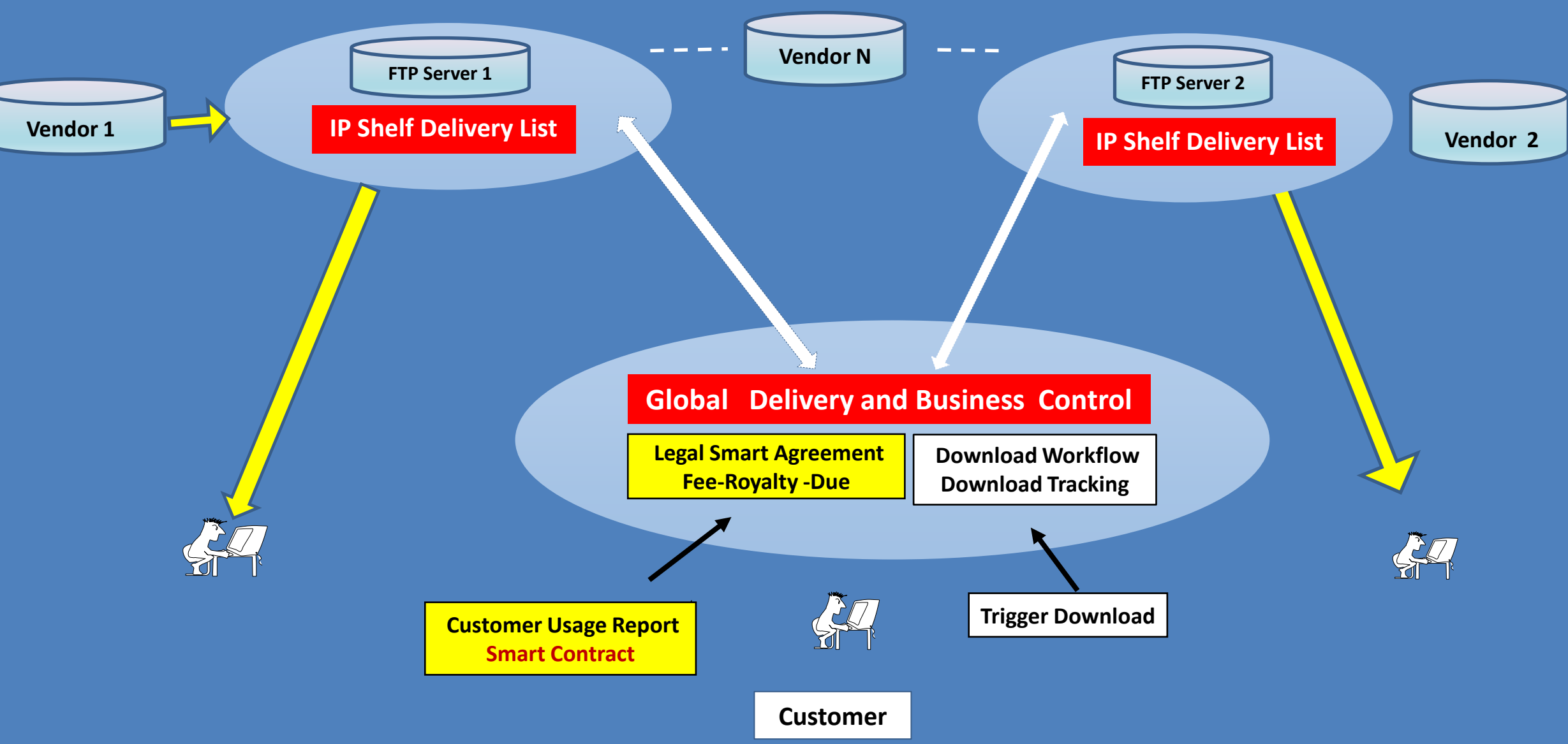
		Royalty Function	Pricing				Shipment Volume			
		Template Name	Rate Dependency	Annual Price Break	Extra Life Time Dollar Cap	Period Coverage	Volume Break	Volume Cap	Extra Life Volume Cap	
Python Edit		Annual Volume Cap – Product Centric	Volume	No	Yes	Annual		Per product	Yes	
Python Edit		ASP – Annual Price Break – IP Centric	ASP	Yes	Yes	Annual	None		Yes	
Python Edit		Annual Price Break	None	Yes	Yes	Annual			Yes	
Python Edit		Annual Volume Cap – IP Centric	Volume	No	Yes	Annual		All Products	Yes	
Python Edit		ASP – Lifetime Volume Break – IP Centric	ASP Volume	No	Yes	LifeTime	All Product		No	
Python Edit		ASP – Lifetime Volume Cap – IP Centric	ASP Volume	No	Yes	LifeTime		All Products	No	

Application 2 :Smart Contract in a Core Store

Within a Core Store

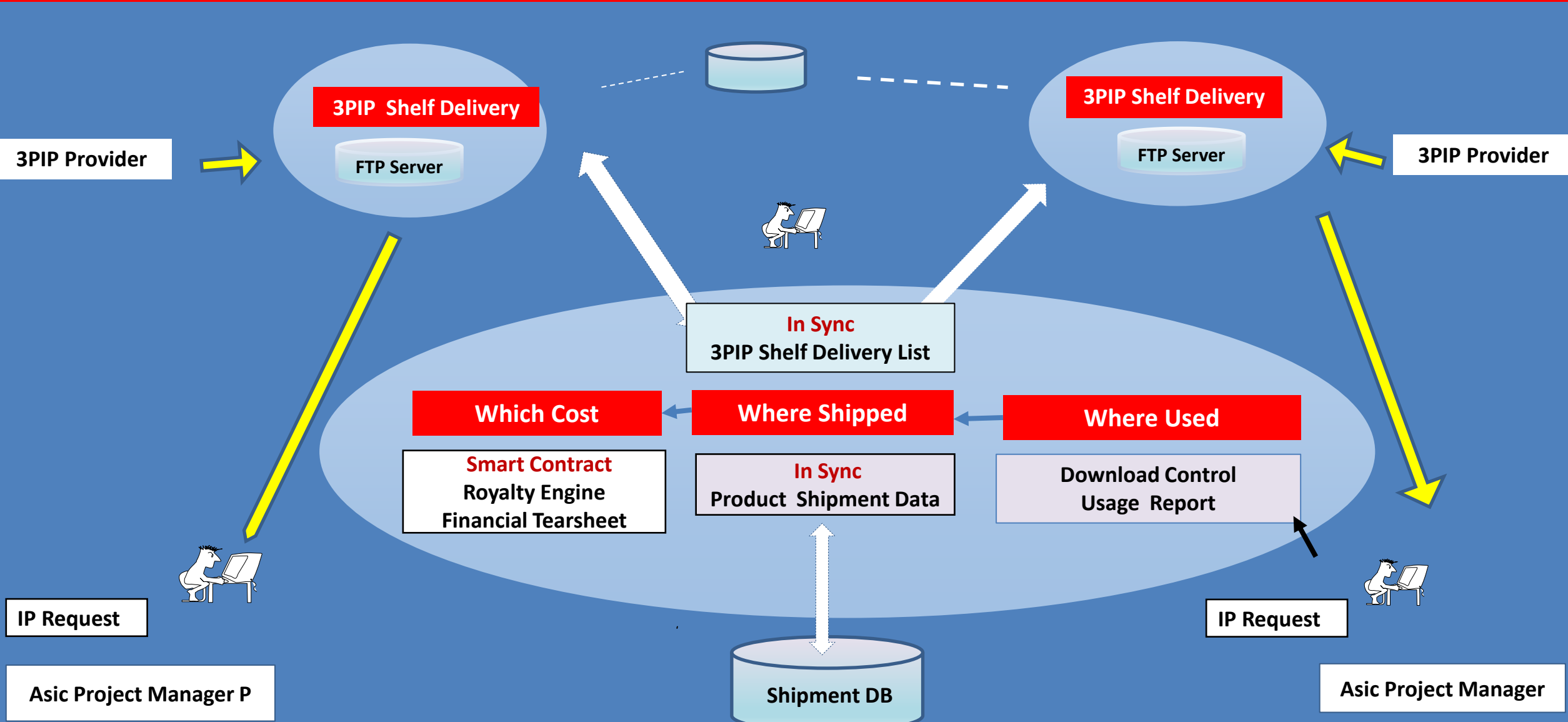
- **“Consensus” between Community members** (Block Chain management?)
 - All Delivery tracked
- Royalty function library **Shared within the Core Store**
- **Consumer reporting about the usage(shipment) in the Delivery extranet station**
 - Automated Royalty calculation
 - Power & Brand of a Consortium/ Core Store can help
 - Payment alert and tracking
- Confidentiality respect for each vendor
 - No litigation between vendor and customer

Core Store Infrastructure & Smart Contract



IPMS™

IP Consumer :Smart Contract and control your 3PIP Life Cycle



Conclusion

- Next generation IP business
- (multi vendor) Solutions rather than IP
- IP democratization: Fast and secure world wide access in consolidated nodes
 - Collaborative platform
 - Core Store
 - Ecosystem
- IPMS tm can make it happen today
 - Smart Delivery for Smart business
 - From Google to Amazon