IBM i <u>and</u> Cloud

A hybrid cloud strategy for IBM's premiere integrated operating system, maximizing client value and minimizing client risk

POW3R   COMMON GERMANY

Steve Will – IBM i Chief Architect

(stwill@us.ibm.com)

27 April 2021

IBM i Anywhere
IBM i Everywhere

IBM

WHY ARE WE HERE?

Top IT Concerns – 2020 Survey

What are your top concerns as you plan your IT environment?

Security	High availability/ disaster recovery	Modernizing applications	IBM i skills	Data growth	Analytics/ business intelligence	Reduce IT spending	Compliance and regulations	Mobile access	Migrating applications to the cloud	Capacity planning	Enterprise systems management tools and SLA management	A.I. (Artificial Intelligence)
77%	66%	54%	45%	28%	29%	28%	25%	24%	25%	14%	11%	12%

https://www.helpsystems.com/resources/guides/ibm-i-marketplace-survey-results
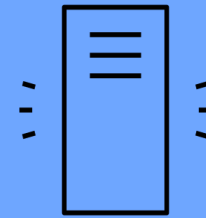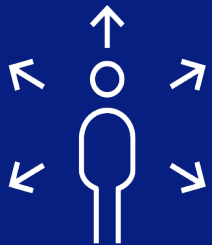
Factors Driving Modernization

Culture
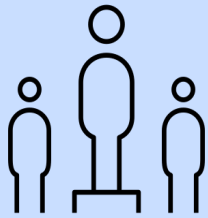
Process
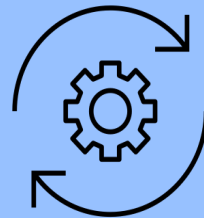
Technology

Skills

Tools

Resources

Time

Different Applications Running on IBM i

Which business applications are you running on IBM i?

76%	26%	11%	11%	10%	3%	2%	1%	1%	1%
Homegrown applications written in-house	Other	Oracle (World, EnterpriseOne, JDE OneWorld)	SAP	Infor (XA, BPCS, System21, PRMS, Infinium, Movex, Lawson, JBA)	Manhattan Associates	Fiserv	Jack Henry	MedHost	McKesson
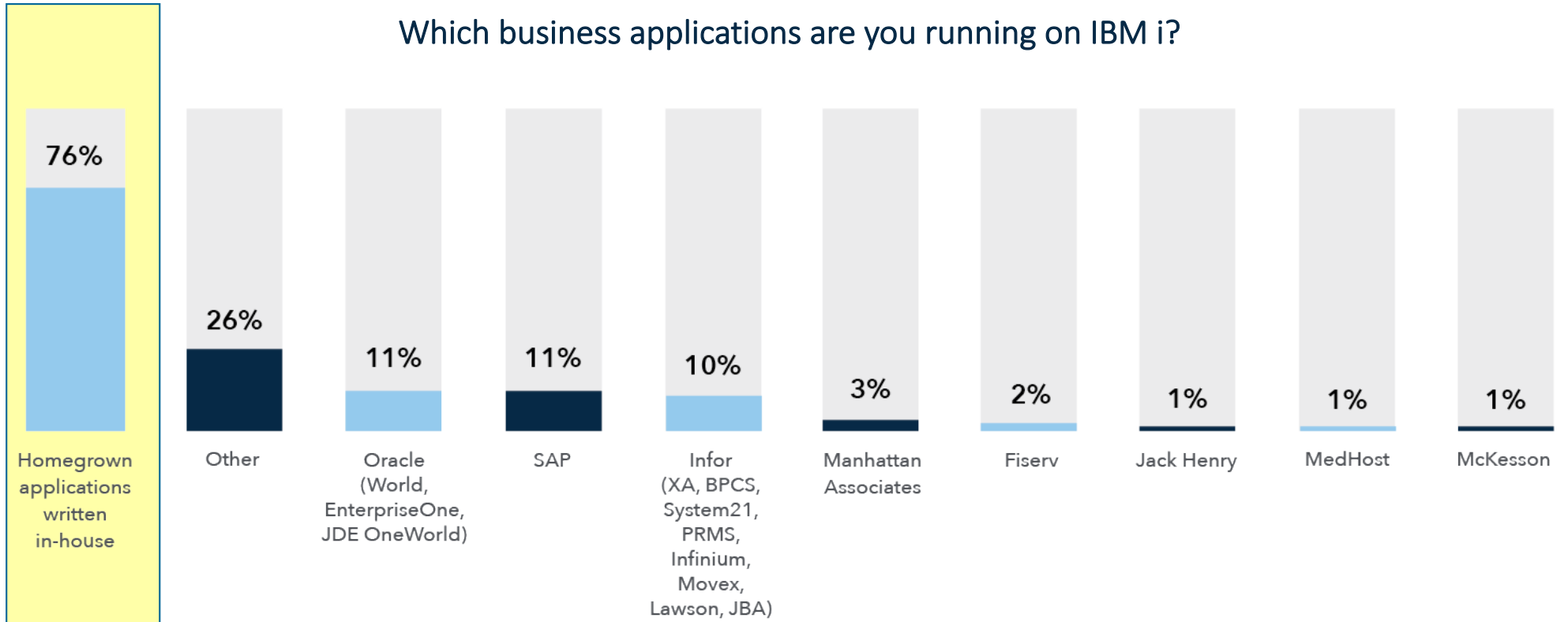
There are literally thousands of ISVs with packages available on IBM i.

https://www.helpsystems.com/resources/guides/ibm-i-marketplace-survey-results

helpsystems

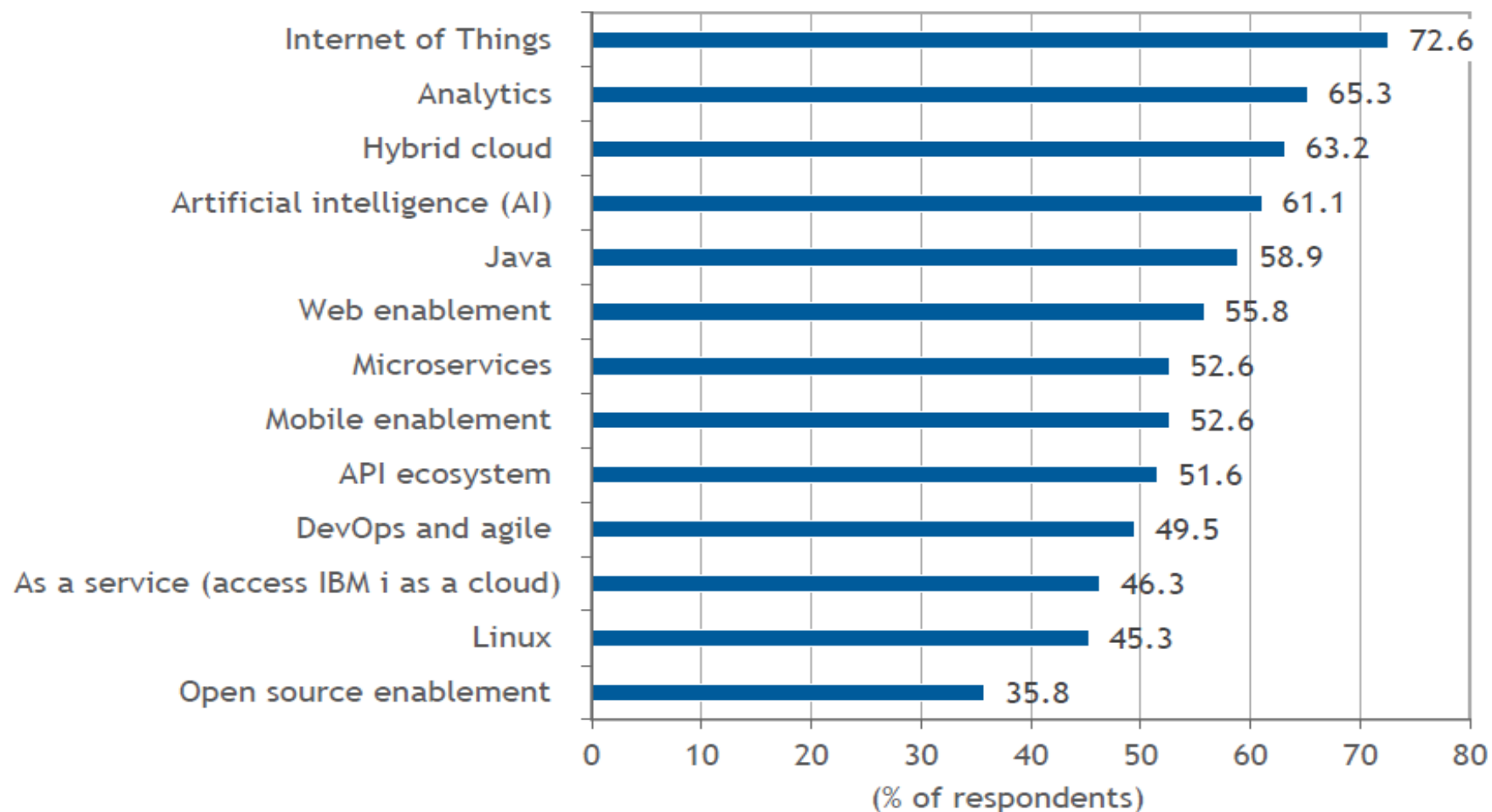# What kinds of "Modernization" are IBM i clients doing?

- User Interface – natural starting point

- Database transformation – take advantage of the power of SQL & Query optimizer
  - Plus encryption, security, XML/JSON, built-in analytics and more

- Integrate cloud-based services – chat bots, AI, ML, weather, markets, ordering, payments, etc.

- Get real-time input from sensors and other Internet-of-Things (IOT) devices

- Guide robotic/automated manufacturing, distribution, warehouses, greenhouses, etc.

- Integrate with social/telco

- Make "services" out of core business logic for use by clients, partners & internal software

- And more …

IDC – Modernization Initiatives on IBM i

IBM i Anywhere
IBM i Everywhere

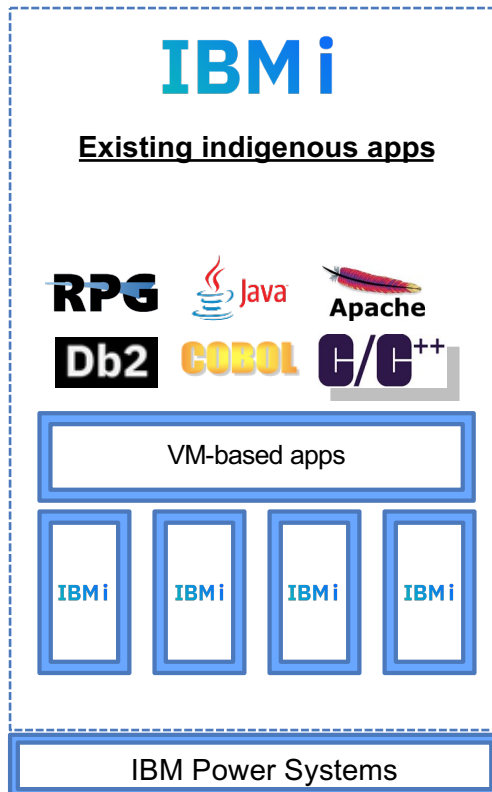| Initiative	% of respondents
Internet of Things	72.6
Analytics	65.3
Hybrid cloud	63.2
Artificial intelligence (AI)	61.1
Java	58.9
Web enablement	55.8
Microservices	52.6
Mobile enablement	52.6
API ecosystem	51.6
DevOps and agile	49.5
As a service (access IBM i as a cloud)	46.3
Linux	45.3
Open source enablement	35.8

(% of respondents)

8

What kinds of "Modernization" are IBM i clients doing

- User Interface – natural starting point

- **Database transformation** – take advantage of the power of SQL & Query optimizer
    - Plus encryption, security, **XML/JSON**, built-in **analytics** and more

- **Integrate cloud-based services** – weather, markets, ordering, payments, etc.

- Get real-time **input to business apps** from **sensors** and other Internet-of-Things (**IOT**) devices

- Guide **robotic/automated** manufacturing, distribution, warehouses, greenhouses, etc.

- Integrate with **social/telco**

- Make **"services" out of core business logic** for use by clients, partners & internal software

- And more …

"Cloud"-related modernization

Modernizing Adds Value to Existing Assets

IBM i

Existing indigenous apps

RPG · Java · Apache

Db2 · COBOL · C/C++

VM-based apps

IBMi · IBMi · IBMi · IBMi

IBM Power Systems

Modernizing **protects the value** created as the business solution evolved
- Business practices and processes
- Data model
- Competitive advantage
- Client, Partner, Supplier interactions

Modernizing **extends the value** by integrating new technology *with purpose*
- Customized user interface
- Services from other software
- Db2 definition leveraging SQL, Analytics, XML/JSON, Encryption
- Implementing Agile, CI/CD, DevOps
- Enabling new programmers & infrastructure engineers
- Creating opportunities for Opex within IT budgets

The IBM i Hybrid Application Development Strategy

IBM i

World's Best RDBMS

COBOL+RPG

Lowest cost of ownership (TCO)

Reliability, securability, efficiency

Protection of investment

Open Source

Enterprise Ready

Microservices / APIs

DevOps

Internet of Things

Web Technologies

Pathway to Innovation

Focus: **Integration, integration, integration!!**

Continued investment in:
- Language (Python, Node.js, PHP) integration libraries
- Various Message Queueing technologies
- Integration with cognitive and quantum technologies
- Db2 enhancements
- Db2 connectivity (ODBC)

Many technologies available in RPM form
Many many more available from the community

To learn about RPMs and get started, see
http://ibm.biz/ibmi-rpms

rpm

IBM i Strategy – Give Clients Choices

Goal: - **Code what needs to be coded using languages fit for the purpose**
- **Integrate what needs to be integrated**

Traditional Languages & Environments
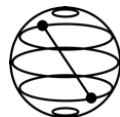

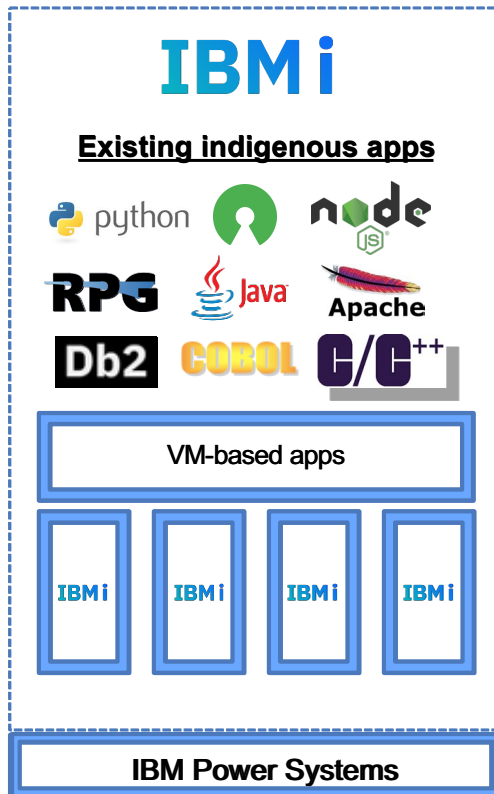**IBM WebSphere® Liberty**

Open Source Language Runtimes

Tools

Open Frameworks

Modernization Often Starts on IBM i – with Modern Languages

IBM i

Existing indigenous apps

python | node (js)

RPG | Java | Apache

Db2 | COBOL | C/C++

VM-based apps

| IBM i | IBM i | IBM i | IBM i |

IBM Power Systems

Many options, and great value, from modern languages "running native"
- Open Source languages, frameworks and tools can easily be added
- Allow new developers to "hit the ground running" with tech they know
- Open languages frequently built for modern requirements
  - Mobile interfaces, services & microservices, analytics …
- Modern RPG easily learned by non-IBM i developers
  - ILE, free-format, not tied to 5250, using modern development tools

Projects start by adding incremental value, and adding more, quickly
- Many client stories, testimonials & descriptions of projects
- Help available from service, partners, community
- Code examples are plentiful

Many client stories with Traditional + Open

IBM i

Anywhere

IBM i Anywhere
IBM i Everywhere

*"The ability to run the latest **open source software** alongside unmodified code from the 1980s is surely unheard of on any other platform, and this **offers huge value** to our business in terms of **reducing** both **ongoing risk** and **costs in IT**."*

https://www.ibm.com/case-studies/cras-systems-open-source

*"The fact that the platform supports **open source solutions** means that we can **leverage the very best technology** and benefit from the support and development of the open source community while **avoiding** inhibitive **licensing costs**."*

https://www.ibm.com/case-studies/fibrocit-systems-furniture-design

*"We can develop in C, PHP, Java – there's now a full range of **open source software** on the platform that **meshes seamlessly with the core technologies** that we've been **running for decades**."*

https://cms.ibm.com/case-studies/kube-pak-systems-gardening-wholesale

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Modernization Often Starts on IBM i – with Modern Languages

IBM i

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python | node
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The same techniques for modernizing natively can be used for modernizing for Cloud!

You and i – IBM i AND Cloud

By Steve Will posted Fri February 26, 2021 02:38 PM

It's "IBM i **AND** the Cloud," not "IBM i **OR** the Cloud"

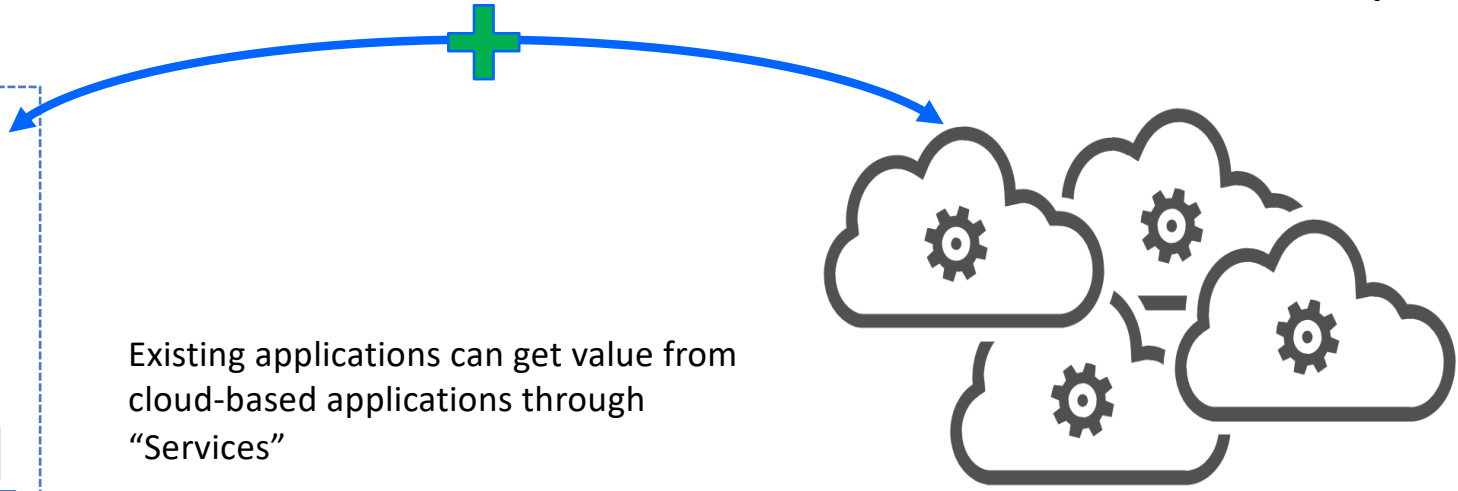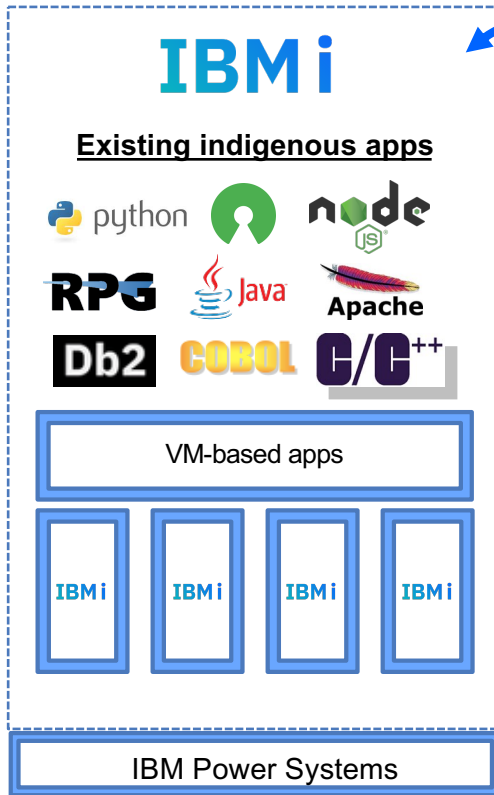https://community.ibm.com/community/user/power/blogs/steven-will1/2021/02/26/you-and-i-ibm-i-and-cloud

IBM i does "modern" on its own – and plays well with others

- On IBM i: Db2, Modern RPG, Open Source allow native

  – Analytics with live data – with security
  – Modularity + easy transfer of knowledge to new programmers (Fresh Faces)
  – Integration of existing open source libraries for AI, Machine Learning, Data Streaming, etc.

- To achieve business value or strategy, production IBM i can integrate with

  – High-performance enterprise services on other platforms
  – Adjacent IBM i workloads on other systems
  – "Services" provided in the IT landscape
  – Public-cloud resources

Modernizing with Cloud Value - IBM i _and_ Cloud

IBM i

Existing indigenous apps

python | node JS

RPG | Java | Apache

Db2 | COBOL | C/C++

VM-based apps

IBMi | IBMi | IBMi | IBMi

IBM Power Systems

Existing applications can get value from cloud-based applications through "Services"

- Existing IBM i applications call services

- Refactored IBM i applications can provide services to others – easily, in a standard Restful way

The process of modernizing for services is very similar to modernizing for better UI

IBM i _and_ Cloud – Modernizing to extend value, using Cloud

IBM i

Existing indigenous apps

python · node · RPG · Java · Apache · Db2 · COBOL · C/C++

VM-based apps

IBM i | IBM i | IBM i | IBM i
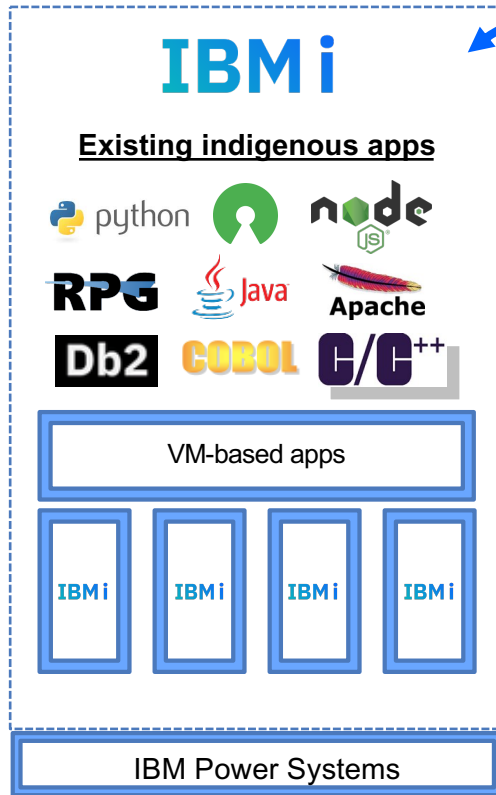
IBM Power Systems

The "Cloud" options on Power Systems allow container-based applications and native IBM i applications to provide value to one another.
- In the same data center, treated as a cloud
- Outside the data center, in a public or partner cloud
- In both places – a Hybrid cloud

IBM i Next Gen Applications
Modern IBM i applications are
- Modular
- Agile/DevOps capable
- Robust/Highly Available

Clients have better results with modernization than re-platforming.

Cloud with IBM Power Systems

Modernized container-based apps

SAP · Java · IBM · Db2 · ORACLE · APIs

New cloud-native container apps

Existing VM-based apps
RPG · Db2 · Java

IBM Cloud Paks

IBM Cloud Paks · NGINX · kafka · python · node · mongoDB · Knative · Golang

VM IBM i | VM IBM i

Red Hat OpenShift

IBM Power Systems

IDC
ANALYZE THE FUTURE

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https://idcdocserv.com/US46775720
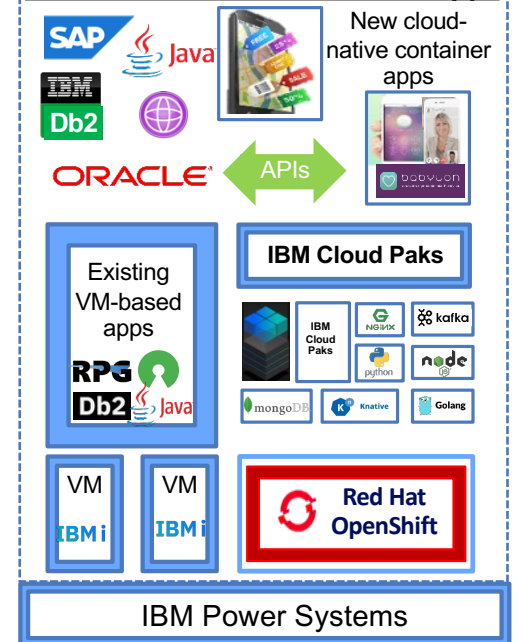
Satisfaction after Modernizing vs. Replatforming

	Modernizers	Replatfomers
Customer experience	4.16	3.96
Overall performance of the platform	4.16	3.94
Security, availability, and disaster recovery of the platform	4.15	3.84
Agility, microservices, DevOps, and open source capability and ability to use modern languages of the platform	4.10	3.89
Ease of finding and keeping talent	4.10	3.90
Ability to incorporate AI and/or IoT into the platform	4.04	3.89
API, mobile, and web enablement of the platform	4.01	3.84

■ Modernizers
■ Replatfomers

https://idcdocserv.com/US46775720

IBM i Next Generation Application Structure
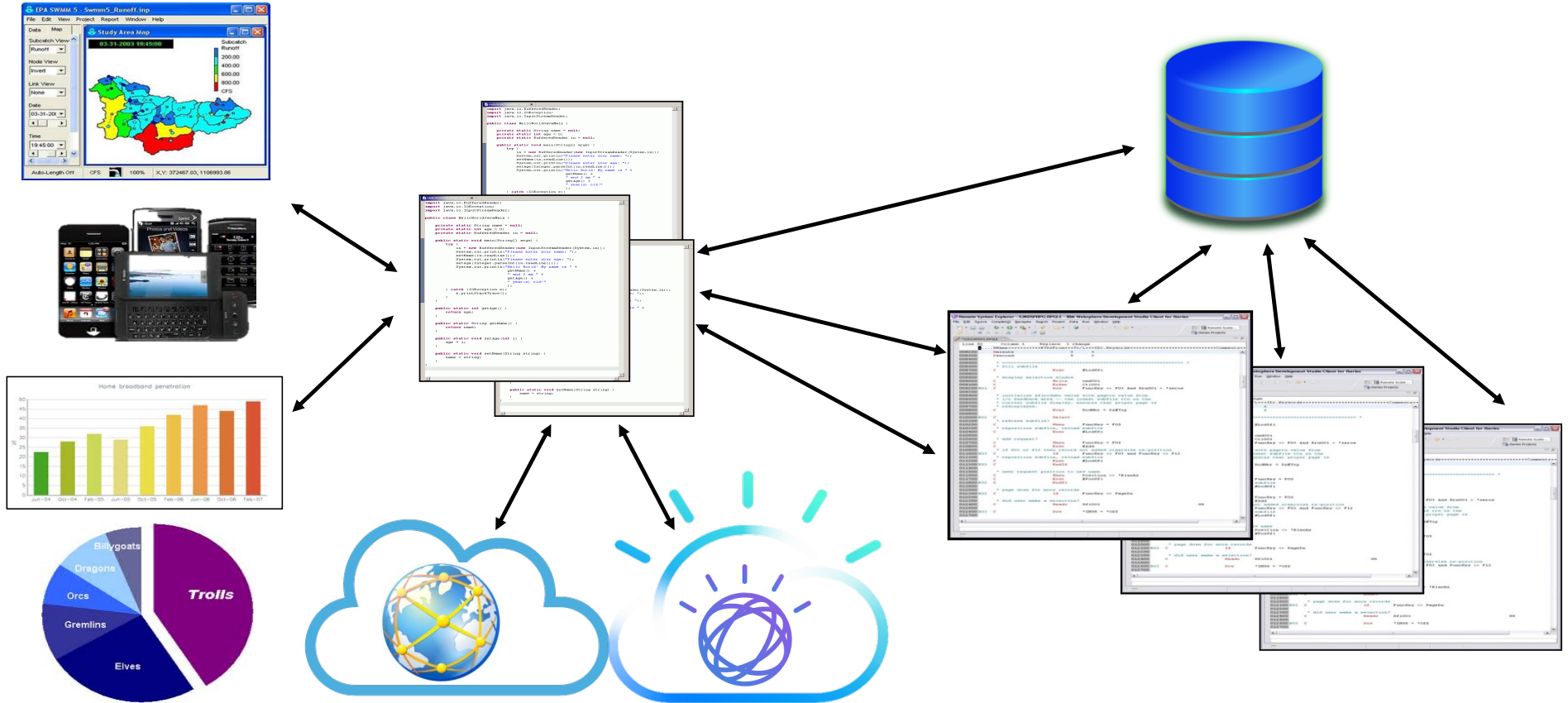
Existing modernization technology & steps

RPG pgm
Main;
    Open Display File
    Open Database
    Read data

   **Call Proc
(Compute Ticket Price)**

    Show Screen
    Listen for Action
    Buy Ticket
End PGM;

RDi

Refactor – Extract Critical
Business Logic with existing tool

1

Proc;
Compute Ticket Price
    - calculate
        - factor class
        - factor # tickets
        - factor in Tax
End Proc

2

Make it into a
cloud-ready
Rest service
with existing
IWS

Rest API Engine

Application

Application

Cloud Applications Access
Key Business Logic and
Data via Rest

3

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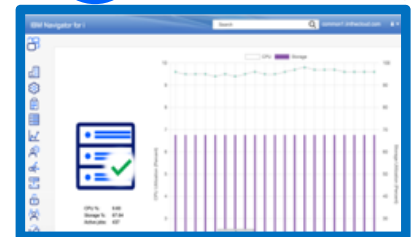
Application Modernization Patterns/Aspects

Discover apps

Expose with APIs & Services

Enterprise DevOps

Extend existing apps

Refactor and Locate near the data

Exploit data streaming

What About IBM i Running in the Cloud?

IBM i has been offered in "Clouds" for years …

Public Cloud Use Cases from IBM i Community

ISV expansion with Public Cloud

With the help of the public Cloud, ISVs can expand the footprint of their products globally with shorter time to value using Power Infrastructure in the Cloud.

Test AIX and IBM i in the Public Cloud

A separate but secure sandbox environment for Power users and ISVs to test their own AIX or IBM i workloads, try out new OS versions operating systems or the latest hardware available.
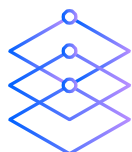
Run enterprise Power workloads in the Cloud

AIX and IBM i applications are no longer restricted to on-premise. Help clients build out a hybrid cloud environment with the ability to host their AIX and IBM i based mission-critical ISV apps in the public Cloud.

Disaster Recovery without double commitment

Currently, AIX and IBM i clients need to build out their own datacenter to ensure DR. Now, with the Cloud, they get those options at a more affordable cost.

2
6

Infrastructure as a Service Model

Customer Portal

| ≡ IBM **Cloud** | Search resources and offerings... | 🔍 | Catalog | Docs | Support | Manage ∨ |

Getting started
Manage
Plan

Resource list /

Ⓟ power-virtual-server

Resource group: Default   Location: Washington DC   Add Tags
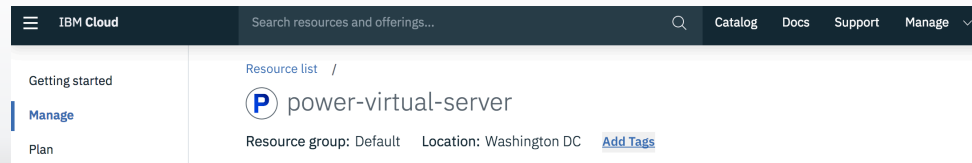
Customer/BP/MSP/GTS Managed

PTFs
Upgrades
Backups
DR/HA

IBM Managed

Power Systems and Storage

27   27

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IBM Power Virtual Server DC Rollout Target
(as of 1/27/21, updated twice monthly)

DAL13 Expand
- October-Present

WDC04 Expand*
- Target Q1 2021

OSA21
- Target March 2021

MON01
- Target Q1 2021

SYD05
- Target Q2'21

SAO04
- Target TBD

*As part of this expansion, 980s will be available for HANA

Due to Covid-19's impact on travel, supply chain and onsite resource restriction, the target dates remain fluid and could move in either direction as mitigations are worked and regulations are adjusted.

GA Centers

FRA04	TOR01	
FRA05	WDC04*	SYD04
LON06	LON04	DAL12
DAL13*	TOK04	SAO01*

*New/Expansion

- In Deployment, good confidence
- DC setup, HW ordering, fair confidence
- Architecting and Planning, target only

Power Systems in IBM Cloud

IBM i Anywhere
IBM i Everywhere

IBM Power Systems Virtual Server on IBM Cloud

- Self-provision and purchase monthly subscription virtual machines from IBM Cloud
- Self-service VM management of pool of compute, memory, storage & network infrastructure
- Secure access to PowerVM-based LPARs through client-owned IBM Cloud resources
- IBM manages IaaS resources and supports everything up to the operating system (OS)
- Client self-manages the OS and all software installed atop the OS
- Client can bring their own OS images and add to IBM-provided OS images
- Client can bring their own software for ISVs who support BYOL for public cloud

Power IaaS Details:

Systems:	S922, E880 or E980 (Frankfurt)
Compute:	0.25-143 cores (15 for S922, 143 for E880/980),
	Dedicated or Shared option for Cores
Memory:	8-64 GB per core
Storage Type:	Type: Tier 3 or Tier 1
Storage Quantity	10 GB minimum, 10 GB increments
Network:	Public and/or Private IP
OS:	AIX / IBM i

Multi-tenant, self managed,
Power Infrastructure-as-a-Service in IBM Cloud
with consumption-based OPEX pricing

Pricing Methodology:

Consumption based pricing:
- Hourly pricing, monthly billing

Data centers:
- Dallas, Wash D.C. and Frankfurt today
- London in 1Q2020

29
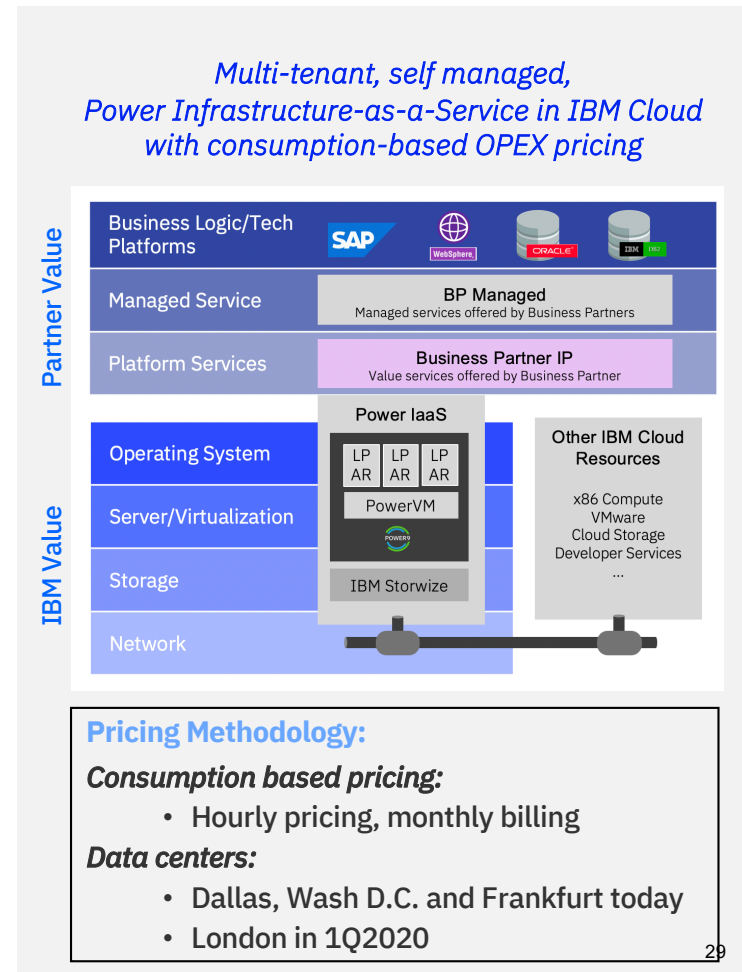
Integrated into the IBM Cloud Catalog

IBM i Anywhere
IBM i Everywhere

30
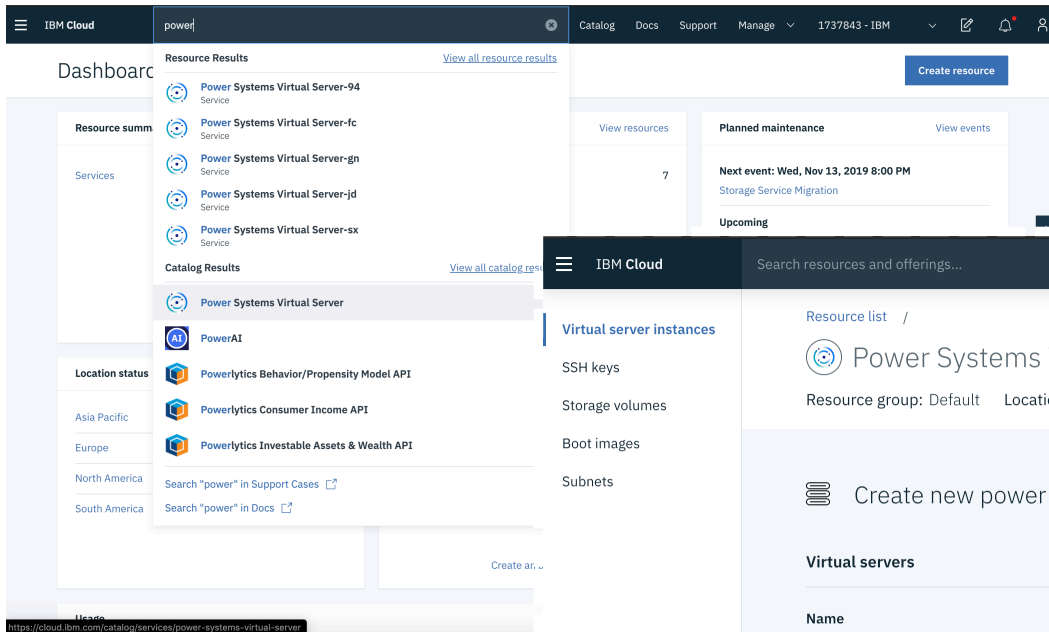
Access the offering from the IBM Cloud Portal
cloud.ibm.com and search for Power.

IBM i Anywhere
IBM i Everywhere
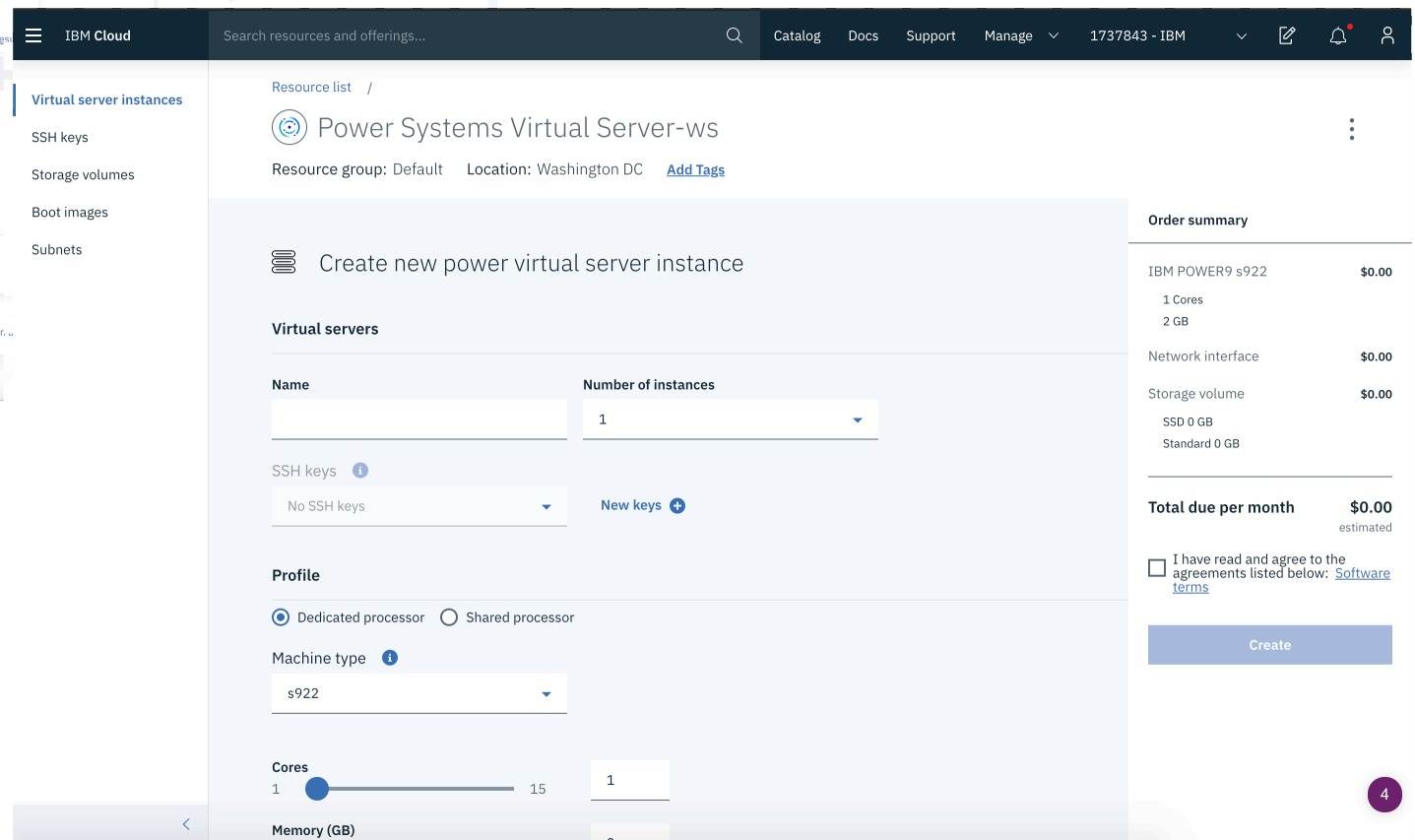
- Create a resource group in your desired region.
- Customize the LPAR with the amount of cores, memory, storage, and operating system.
- Provision in moments.

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4

Recent Features Added to PowerVS

IBM i Anywhere
IBM i Everywhere

System Reference Code

SRC	Timestamp
00000000	

SRCs
and
Panel Functions

Operations

The following actions are advanced actions which may have a critical impact on your service. Only one operation may be run at a time, learn more.

Job operations	Boot operations

Actions

- ⦿ (21) Activate dedicated service tools
- ○ (34) Retry Dump
- ○ (66) Enable remote service
- ○ (67) Disk unit IOP reset / reload
- ○ (70) IOP Control storage dump
- ○ (22) Dump restart

Cancel	Run action

IBM i Compute Considerations

E880 or E980 is a P30 SW tier

S922 is a P10 SW tier

Choose your machine type, processor, memory and cores.

Machine type
- e980
- ✓ s922

Processor

◯ Dedicated ● Shared uncapped ◯ Shared capped

Memory (GB)

2

Cores (CPUs)

1.25

IBM i Shared Uncapped Processors

CPU shows entitlement

For IBM i, the VCPU # is rounded up

– In this example the VCPU quantity would be 2

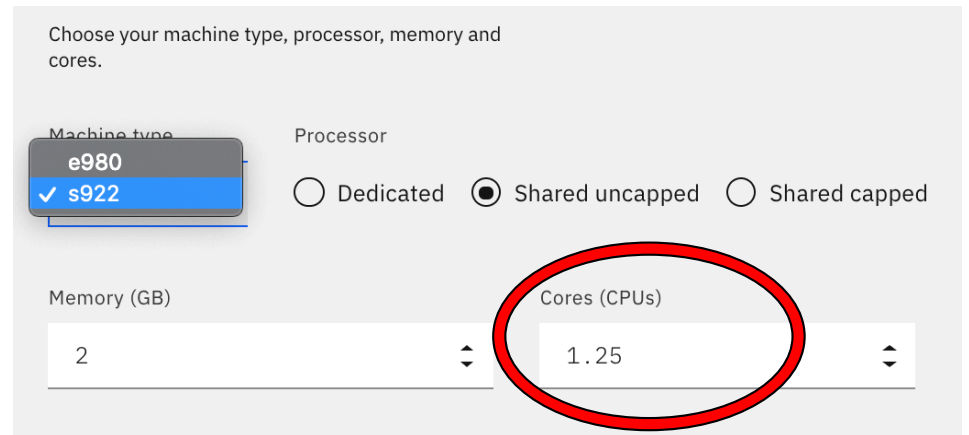IBM i has a limit of 4 VCPU/4 cores of entitlement on the S922 per VM

Choose your machine type, processor, memory and cores.

Machine type
e980
✓ s922

Processor
◯ Dedicated   ◉ Shared uncapped   ◯ Shared capped

Memory (GB)
2

Cores (CPUs)
1.25

IBM i Software available

~~3~~ 4'Stock' images available get copied to your account as boot volumes

- – IBM i 7.1
- – IBM i 7.2
- – IBM i 7.3
- – IBM i 7.4

Additional LPP are available to added on at create time or dynamically added later.

- – 5770-HAS and 5733-ICC are per .25 core priced
- – 5770-WDS is user based
- – All software is relative to this one VM
- – Db2 Web Query for i (5733-WQX)

SWMA included in the price of the software

Operating system		Image
IBM i	⌄	✓ Select an image
		IBMi-72-09-003
IBM i Licenses		IBMi-73-07-001
☐ IBM i Cloud Storage Solution		IBMi-74-01-001
☐ IBM i Power HA		
☑ Rational Dev Studio for IBM i		
Number of users (RDS Only)		
5		

35

Db2 Web Query for i now in the PowerVS Offering

Base IBM i and LPP Package Software

•5770-SS1 IBM i OS – processor and includes unlimited users

- 5770-DG1: HTTP Server for i
- 5770-JV1: Developer Kit for Java
- 5770-NAE: Network Authentication Enablement for i
- 5733-SC1: Portable Utilities for i
- 5770-TC1: TCP/IP
- 5770-TS1: Transform Services for i
- 5770-UME: Universal Manageability Enablement for i
- 5770-XE1: IBM i Access for Windows
- Zend
- 5733-ARE: IBM Administration Runtime Expert
- 5798-FAX: IBM Facsimile Support for i
- 5770-SM1: IBM System Manager for i
- 5770-DFH: IBM CICS Transaction Server for i
- 5770-MG1: IBM Managed System Services for i
- 5770-SS1: IBM i Option 23, OptiConnect
- 5770-SS1 : IBM i Option 44, Encrypted Backup Enablement
- 5770-SS1 : IBM i Option 45, Encrypted ASP Enablement

– 5770-SS1 IBM i Option 18 Media & Storage Extensions
– 5770-SS1 IBM i Option 26 DB2 Symmetric Multiprocessing
– 5770-SS1 IBM i Option 27 DB2 Multisystem
– 5770-SS1 IBM i Option 38 PSF for IBM i Any Speed Printer Support
– 5770-SS1 IBM i Option 41 HA Switchable Resources
– 5770-SS1 IBM i Option 42 HA Journal Performance
– 5770-AF1: Advanced Function Printing for i (refer to Q&A)
– 5761-AMT: Rational Application Management Toolset
– 5770-AP1: Advanced DBCS Printer Support
– 5733-B45: AFP Font Collection for i
– 5770-BR1: Backup, Recovery and Media Services
– 5761-DB1: System/38 Utilities
– 5761-CM1: Communications Utilities
– 5761-DS2: Business Graphics Utility
– 5648-E77: InfoPrint Fonts
– 5769-FN1: AFP DBCS Fonts
– 5769-FNT: AFP Fonts
– 5722-IP1: InfoPrint Server for i
– 5770-JS1: Advanced Job Scheduler for i
– 5770-PT1: Performance Tools
– 5770-QU1: Query for i
– 5770-ST1: DB2 Query Manager and SQL Dev Kit for i
– 5733-XT2: XML Toolkit
– 5770-XW1: IBM i Access Family - unlimited users included

Movable IBM i is available in Power VS

- What is Movable IBM i (IBM i MOL)?
  - To protect client investment in IBM i entitlements, IBM i MOL allows clients to move existing on-prem entitlements to Power VS instead of purchasing new entitlements
  - Applicable to customers who have valid IBM i entitlements with active SWMA
  - P10 and P30 IBM i OS and base LPP are available as target environments for IBM i MOL (add-on LPPs are excluded)
  - Pricing estimates: Seismic Power VS Pricing Estimator

- When is IBM i MOL Available?
  - Nov. 12, 2020

- What is the value to the customer?
  - Protect client's investment in on-prem IBM i entitlements when moving to Power VS
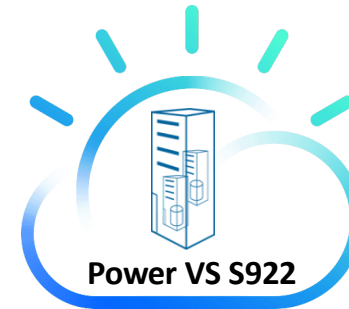 - Lower IBM i subscription fee as opposed to purchasing new IBM i subscription in Power VS

"Movable IBM i" solution (Using IBM i SW P10 tier as example)

IBM i Anywhere
IBM i Everywhere

On-prem client entitlement:
- IBM i OS
- Base LPPs

Power VS S922

- Client has existing perpetual entitlements on-prem
- (with active SWMA)
- Customer wishes to move IBM i workload to Power VS
- Client stops using identified IBM i entitlements on-prem
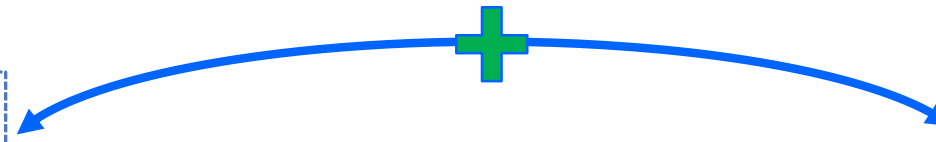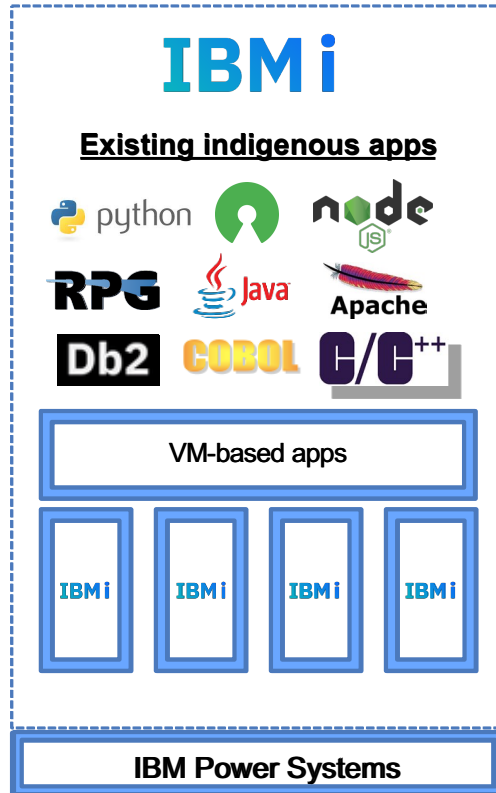- Client stops paying SWMA on-prem

Movable IBM i (Nov 12, 2020)
- Contract signed
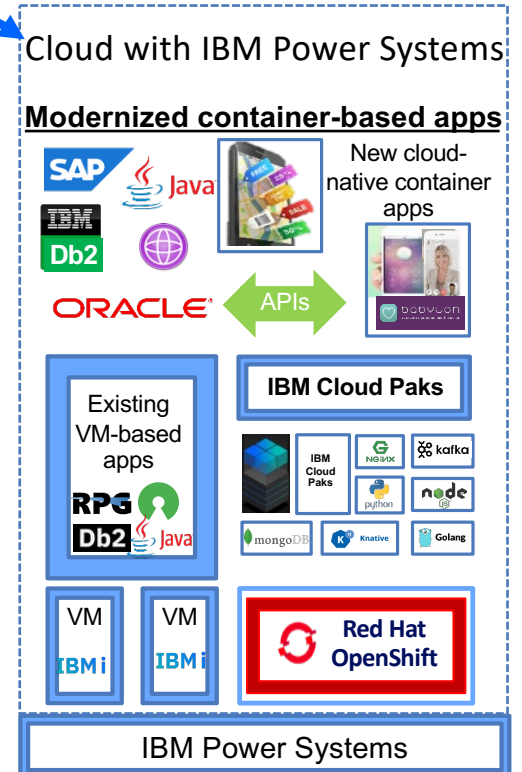- # entitlements to be moved

- Using Movable IBM i
- (P10 software tier as example)
- Client acquires entitlements on Power VS at reduced price
- IBM i Subscription/ core/ month
  - IBM i + Base LPPs + SWMA = $616/month/core
- Need more capacity?
  - IBM i Subscription/ core/ month
    - (Software tier P10 as example)
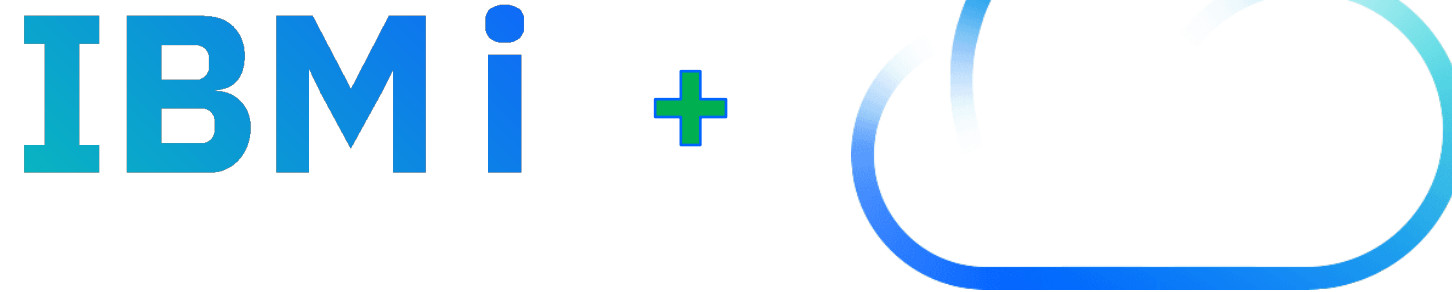   - IBM i + Base LPPs + SWMA = $1400/core/month

IBM i and Cloud

IBM i

Existing indigenous apps

python · node · RPG · Java · Apache · Db2 · COBOL · C/C++

VM-based apps

IBM i · IBM i · IBM i · IBM i

IBM Power Systems

Integrating the value of IBM i

with

the Power of the Cloud

Cloud with IBM Power Systems

Modernized container-based apps

SAP · Java · IBM Db2 · ORACLE · APIs · New cloud-native container apps

Existing VM-based apps — RPG · Db2 · Java

IBM Cloud Paks

IBM Cloud Paks · NGINX · kafka · python · node · mongoDB · Knative · Golang

VM IBM i · VM IBM i · **Red Hat OpenShift**

IBM Power Systems

ID Logistics – France – IBM i in the IBM Cloud

It's "IBM i **AND** the Cloud," not "IBM i **OR** the Cloud"