



Robots Autoscaling 自动改变机器人部署规模

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UiPath 售前顾问

今日议程

1. 高密度机器人
2. Elastic Robot Orchestration (ERO)
3. UiPath Unattended Robots Auto Scaling



高密度机器人

高密度机器人是一项功能，可确保充分利用您所使用的每台机器，使其发挥最大潜力。因此，如果您有多个用户，您可以在每个用户上注册一个机器人。

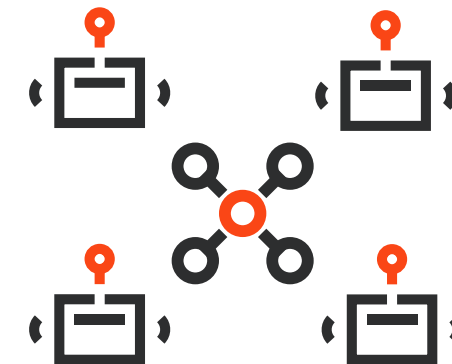
任何类型的机器人，无论是有人值守、无人值守、非生产还是工作室，都可以在高密度环境中进行配置。

高密度机器人可以在用户模式下安装。社区版本默认安装高密度机器人，而运行 UiPathStudio.msi 文件需要您不安装机器人服务。

高密度环境具有以下优点：

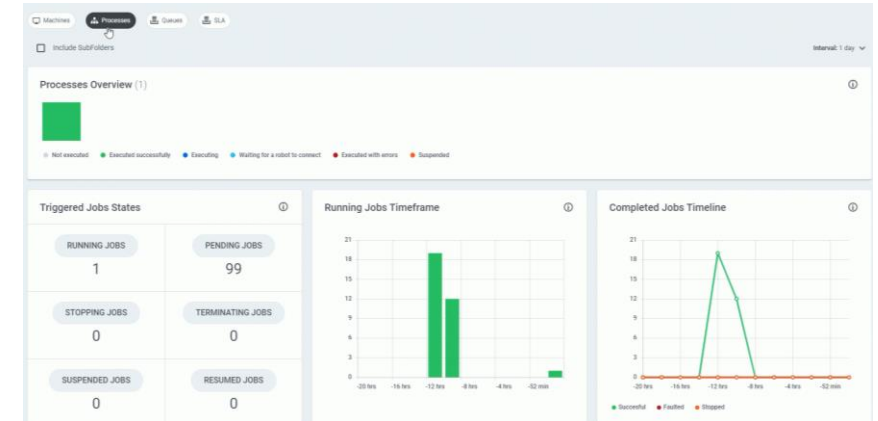
在一个 Orchestrator 实例中，您可以：

- 同时使用多个机器人运行相同的流程
- 同时使用多个机器人运行不同的流程



Elastic Robot Orchestration (ERO) – Cloud Only

- 根据需要自动配置、扩展和更新云中无人值守的机器人，以减少管理
- 旨在根据需要扩展和缩减客户创建的 VM 映像的实例。您可以针对执行速度或最低云成本进行优化
- 全部在您的网络范围内。IT 保留对您的虚拟 LOB 应用和基础架构的控制和管理
- 支持与所有类型的应用程序交互，包括 LOB 应用程序
- Elastic Robot Orchestration 是 Automation Cloud™ 的一项可选功能，无需额外许可。
- 自动扩展到与您分配到云池的数量一样多的云编排无人值守机器人。



CoE Leads使用 Elastic Robot Orchestration 在关键业务自动化紧迫时提供高效容量



IT Operations角色使用 Elastic Robot Orchestration 来降低云成本并降低云机器人的管理开销

Demo Time



Virtual machines - Microsoft Azure

portal.azure.com/#view/HubsExtension/BrowseResou...

"UiPath Web Automation 22.10"已开始调试此浏览器 取消

Microsoft Azure

Search resources, services, and docs (G+)

Joyce.Wang@uipath.com
UIPATH (UIPATH.COM)

Home >

Virtual machines

UiPath (uipath.com)

+ Create Switch to classic Reservations Manage view Refresh Export to CSV Open query ...

Filter for any field... Subscription equals all Type equals all Add filter More (2)

No grouping List view

Name	Type	Subscription	Resource group	Location	Status	Operations
Joyce-Azure-VM	Virtual machine	POC-EA	JoyceResourceGroup	East Asia	Stopped (deallocated)	Windows
UiRobot_19080539-...	Virtual machine	POC-EA	JoyceResourceGroup	East Asia	Stopped (deallocated)	Windows
UiRobot_68815ae5-...	Virtual machine	POC-EA	JoyceResourceGroup	East Asia	Running	Windows
UiRobot_7f871263-...	Virtual machine	POC-EA	JoyceResourceGroup	East Asia	Stopped (deallocated)	Windows
UiRobot_87853ff5-d-...	Virtual machine	POC-EA	JoyceResourceGroup	East Asia	Stopped (deallocated)	Windows

< Previous Page 1 of 1 Next > Showing 1 to 5 of 5 records. Give feedback

EV录屏 新建文本 档.txt

Task Capture

Cygwin64 Terminal

Plantronics Hub

FortiClient

Machines - UiPath Orchestrator

cloud.uipath.com/Demo007/ACR_Test/orchestrator_/monitoring/machines?tid=605&fid=100046

"UiPath Web Automation 22.10"已开始调试此浏览器 取消

UiPath Orchestrator

Tenant

Home Automations Monitoring Queues Assets Storage Buckets Testing

Overview Machines Processes Queues SLA

☐ Include SubFolders

Runtimes (1) Group by Machine

Unresponsive (0) Unlicensed (0) Available (1) In use (0)

Machines (1) Search Columns

Hostname	Machine	Type	Status	R...	In...	Last Hear...
VM75040091DB	Elastic Robot1	Production ...	Available	1	0	-1 min

1 - 1 / 1

https://cloud.uipath.com/Demo007/ACR_Test/orchestrator_/monitoring/machines?tid=605&fid=100046

UiPath Robots Auto Scaling (RAS)

Elastic Robot Orchestration 的本地替代方案

UiPath Robots Auto Scaling (RAS) 是一种基于工作流的解决方案，通过提高 RPA 部署的运行效率来帮助优化 IT 基础设施成本。

Robots Auto Scaling 解决方案是在官方 UiPath IT 自动化活动的帮助下实施的——它们使我们能够在本地数据中心和公共云中自动化我们 IT 生态系统所有领域的用例。

作为自动缩放过程的一部分，机器人机器根据以下功能自动启动/停止：

1. 定义的扩展策略：

- Hot Robots 计数 - 他们的机器一直在运行
- Cold Robots 计数 - 他们的机器将被动态分配/解除分配

2. 客户的现状：

- Jobs (pending, running, completed, stopped, faulted)
- Robots (available, disconnected, busy)

✓ Trusted Source

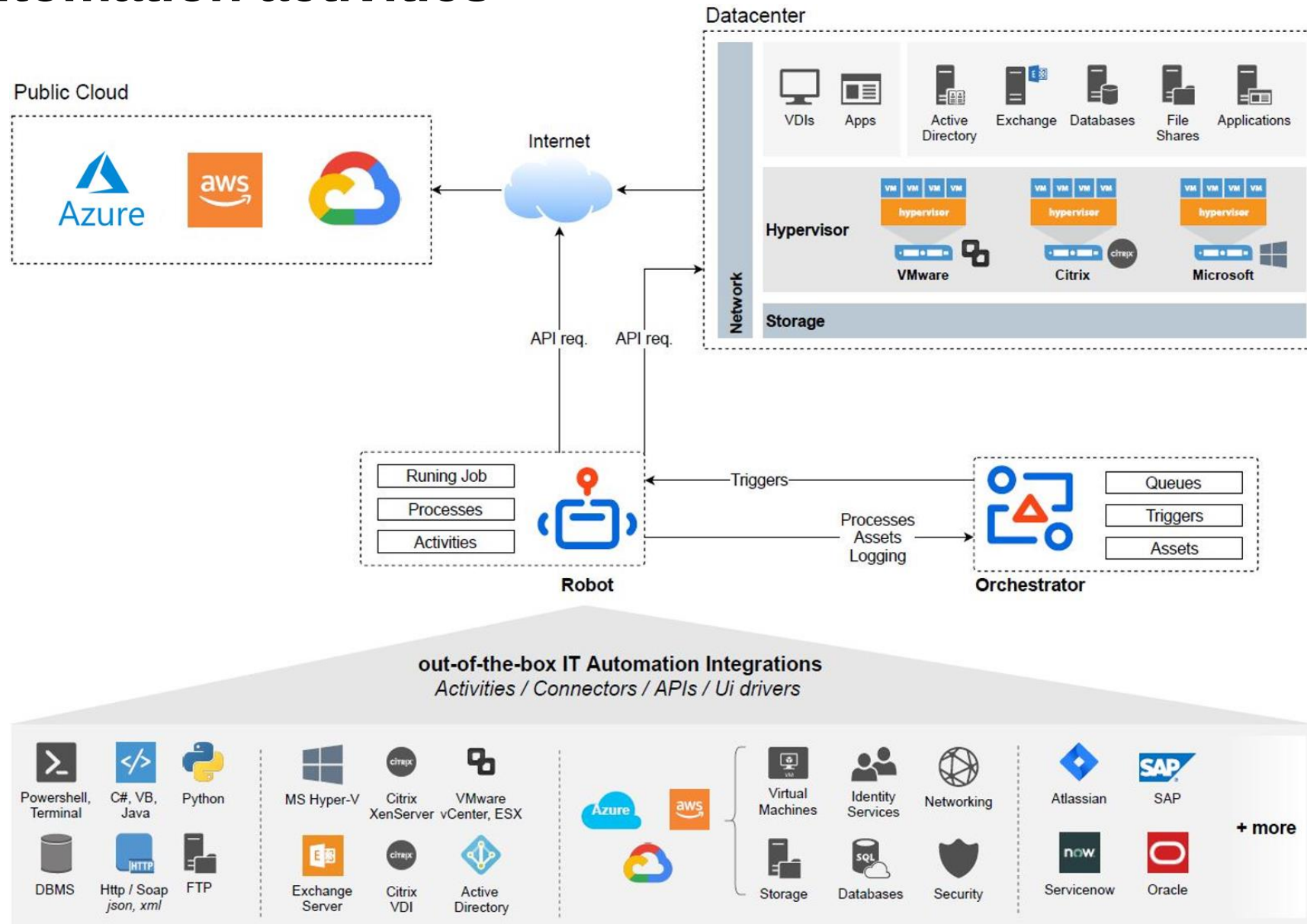


Solution

UiPath™ Marketplace

- ✓ Project source files
- ✓ Step by step configuration guide
- ✓ Autoscaling recommendations
- ✓ Free to download and customize

Empower RPA Workflows with IT Automation activities



通过 IT 自动化活动增强 RPA workflows



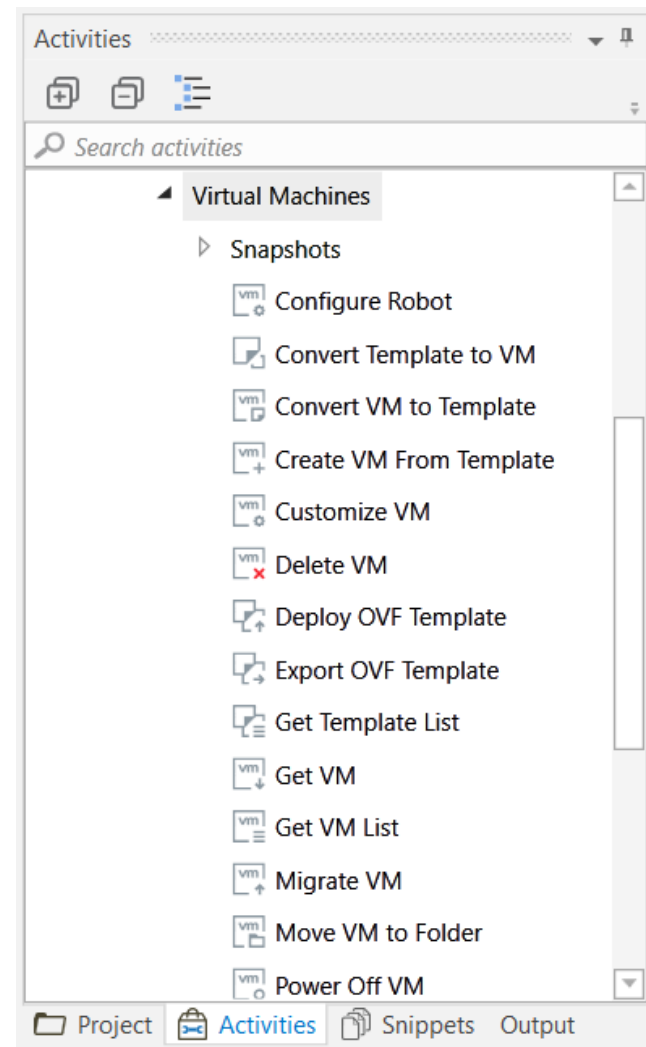
实现

基于 Microsoft、Amazon、Citrix、VMware 等官方 SDK 构建的后台运行活动



安全性和合规性

由 UiPath 开发
发布在官方订阅源上(LTS)

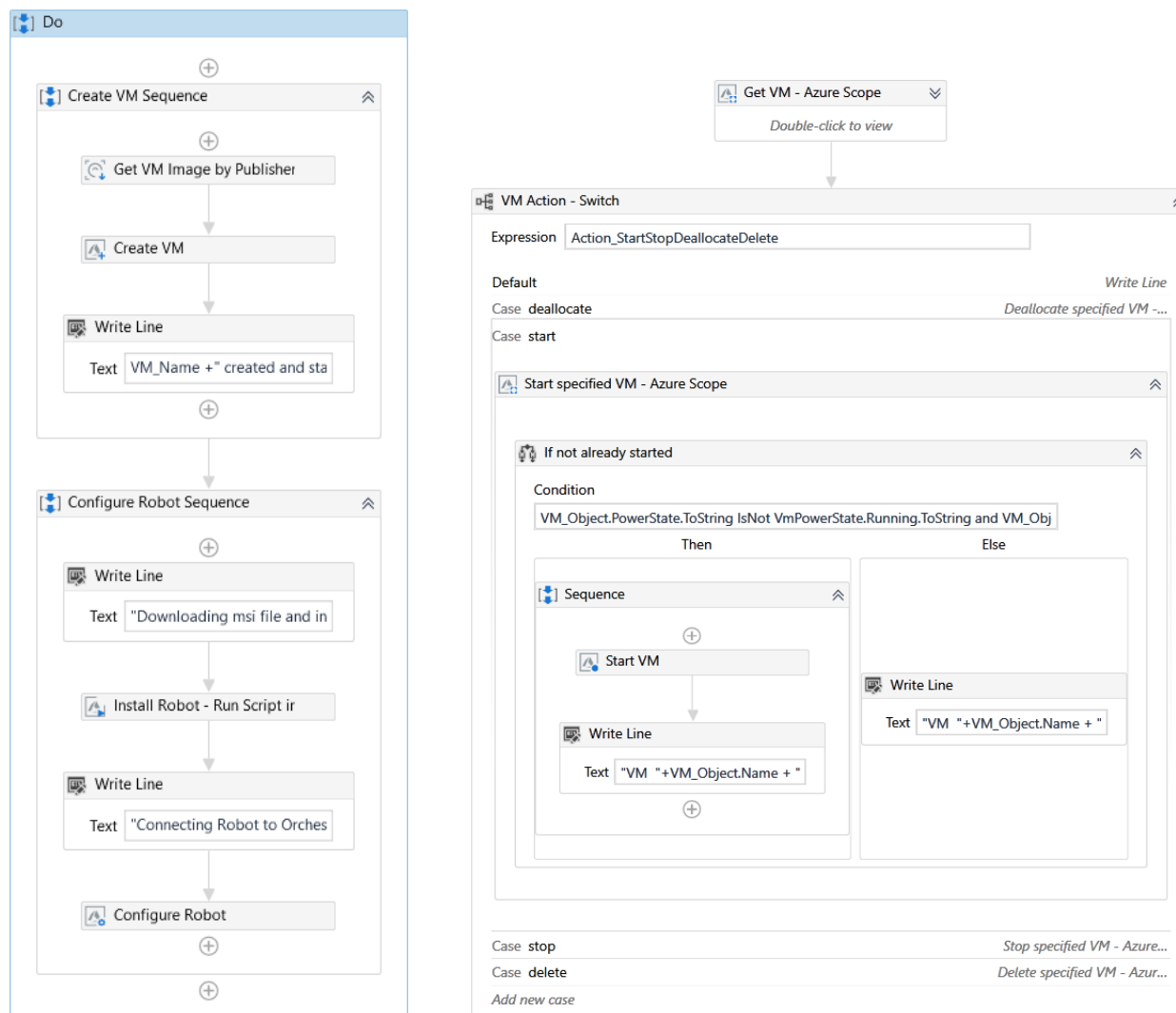


Robots Autoscaling

技术 & 组成部分



由 UiPath IT 自动化工作流程提供支持



透明的

易于理解和检查工作流程的业务逻辑

灵活的

通过开箱即用的可拖放的 UiPath IT 自动化活动轻松更新扩展逻辑

Vendor选择

Azure, AWS, VMware, Citrix 等.



IT Automations workflows Trusted by UiPath

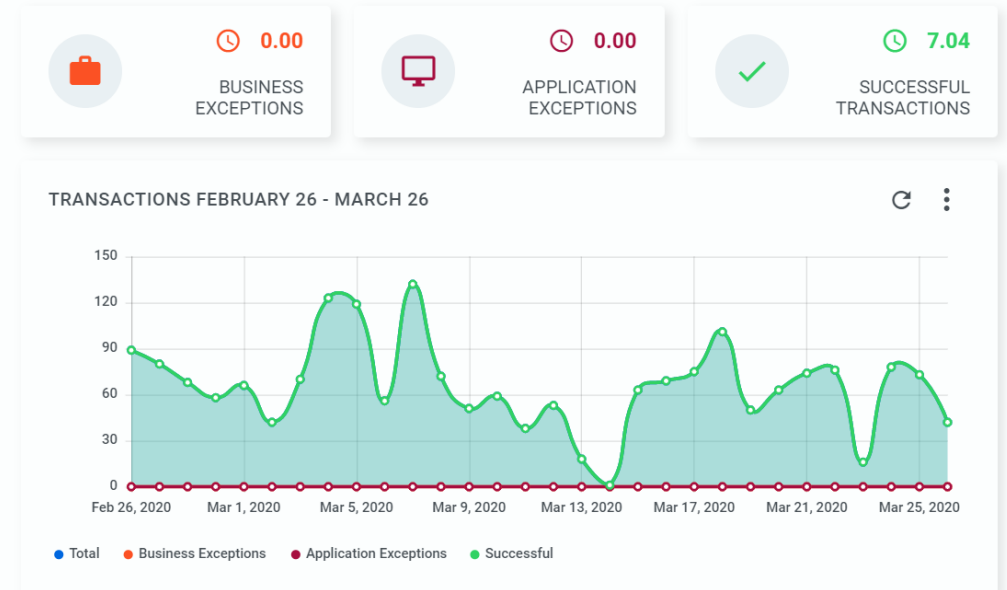
成本控制

☐ NAME ^	PROCESS ↕
☐ Azure (POC rg sergiu) policy based VMs start/deallocate	AzureVMsOnDemandAvailability_IT-Ops-Cloud
☐ Azure (QA QA-Orchestrator-Cluj-RG) policy based VMs start/...	AzureVMsOnDemandAvailability_IT-Ops-Cloud
☐ Azure (UTC +2) VMs Daily PowerOn	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure (UTC +2) VMs Nightly PowerOff	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure (UTC +5:30) VMs Daily PowerOn	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure (UTC +5:30) VMs Nightly PowerOff	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure (UTC +9) VMs Daily PowerOn	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure (UTC +9) VMs Nightly PowerOff	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure (UTC -5) VMs Daily PowerOn	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure (UTC -5) VMs Nightly PowerOff	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure (UTC -8) VMs Daily PowerOn	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure (UTC -8) VMs Nightly PowerOff	AzureVMsPowerOff_IT-Ops-Cloud
☐ Azure Security Alerts - add rule to block queued attacker IP	AzureVMsAttackersBlock_AddSecurityRuleTo...
☐ Azure Security Alerts - NICs NSG policy - create NSG for NIC i...	AzureCreateNSGforNIC_IT-Ops-Cloud
☐ Azure Security Alerts - queue VM Attackers for blocking in V...	AzureVMsAttackersBlock_IT-Ops-Cloud

Azure 安全性 (对 VM 的暴力攻击)

在过去 12 个月内自动处理了
20.000+ 次攻击

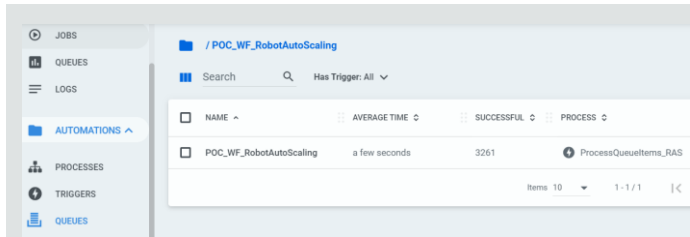
Azure_SecurityCenterAlerts_VMAccess Chart



<https://connect.uipath.com/marketplace/components/it-automation-for-public-private-and-hybrid-clouds>

Robot Autoscaling - 解决方案组成部分

Management Orchestrator



1+ Robots (for HA)

Assets // db conn, infra auth, ..

Queue // webhook events

Autoscale Process Package

Trigger // on new queue item added

Webhook Receiver

```
namespace UiPath.WorkflowSolutions.RobotAutoScaling.Function
{
    0 references
    public static class ReceiveWebhooks
    {
        [FunctionName("ReceiveWebhooks")]
        0 references
        public static async Task<ActionResult> Run([HttpTrigger(AuthorizationLevel.

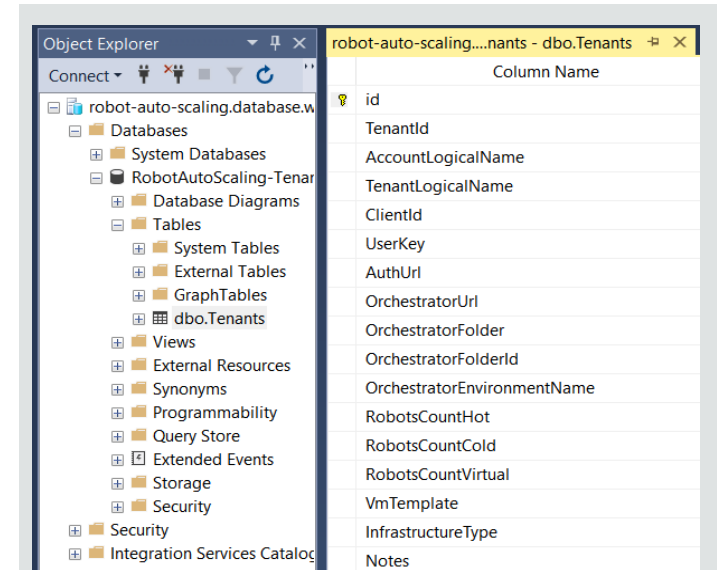
// admin tenant info
18 references
    public static class Constants...

1 reference
    public static class OrchestratorHelper
    {
        1 reference
        public static async Task<string> Authenticate()...

1 reference
        public static async Task<IRestResponse> AddNewQueueItem(string requestBody)
    }
}
```

Events sent via webhooks by the managed clients are added in the Management OR. Queue

Clients Database



Orchestrator API: key, secret, tid, fid, ..
Infra type: Azure / AWS / VMware / ..
Scaling rules: cold / hot Robot no.

Client Tenants

Orchestrator API

Folders

Robots (unattended)

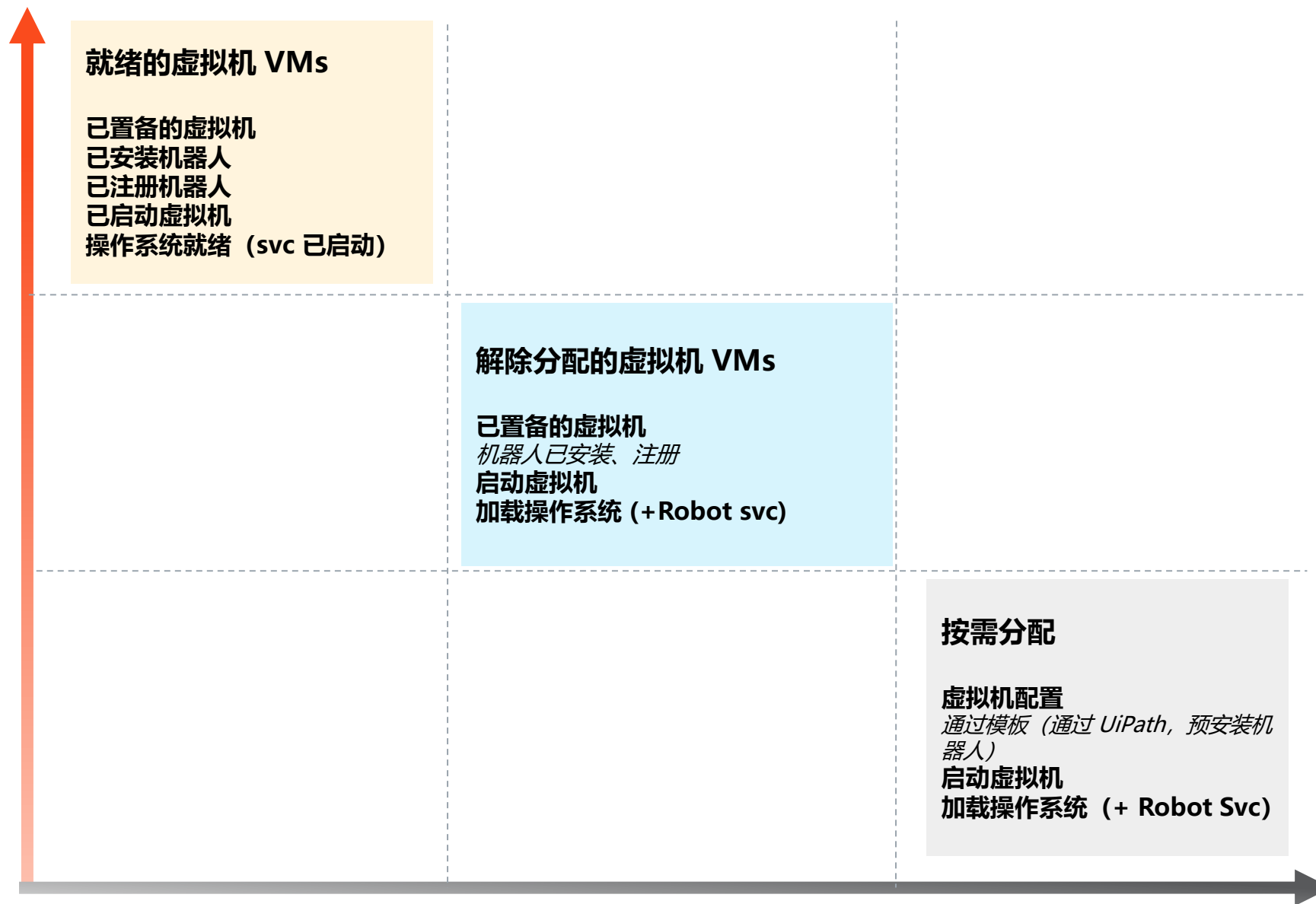
Webhooks

Robots Autoscaling

缩放策略



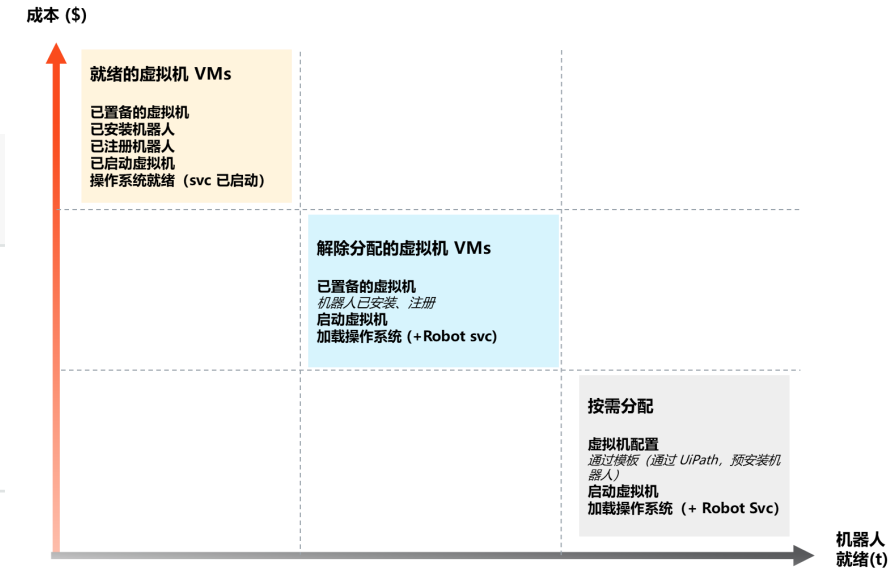
成本 (\$)



机器人
就绪(t)

Autoscaling. Cost vs Availability

机器人类型	VM / Server状态	准备时间 (min)	成本 (\$) VM / 月
 热	就绪的虚拟机 VMs 虚拟机已配置并正在运行，机器人已配置并可用于作业	0	High \$160+ 计算分配
 冷	解除分配的虚拟机 VMs 虚拟机已创建/存在 + 机器人已配置，但已解除分配（仅存储成本）	~2-3	Low \$1.54 HDD standard S4 Medium \$2.4 SSD standard E4
 Virtual	按需分配 VMs VM将从指定的Image + 机器人配置从点播创建	~10	\$0



缩放策略= $F(x,y,..)$

Pending Jobs

Robots Available
Robots Disconnected
Robots Busy

Hot Robots
Cold Robots

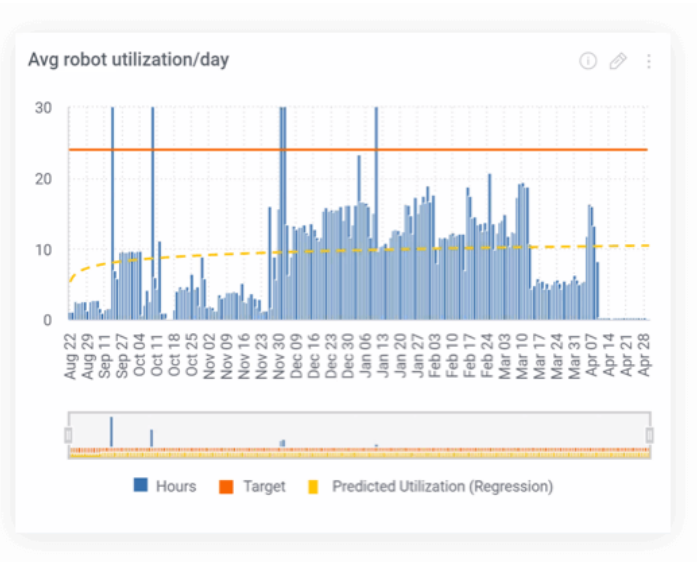
* Azure (即用即付) 参考。虚拟机: D2v3 + 32Gb 标准 S4 硬盘/E4 固态硬盘

轻松定制 – 动态缩放策略

结合机器人使用情况

eg. Insights / 分析作业请求

为确定的间隔调整热/冷机器人数量。



成本 (\$)

就绪的虚拟机 VMs

已置备的虚拟机
已安装机器人
已注册机器人
已启动虚拟机
操作系统就绪 (svc 已启动)

解除分配的虚拟机 VMs

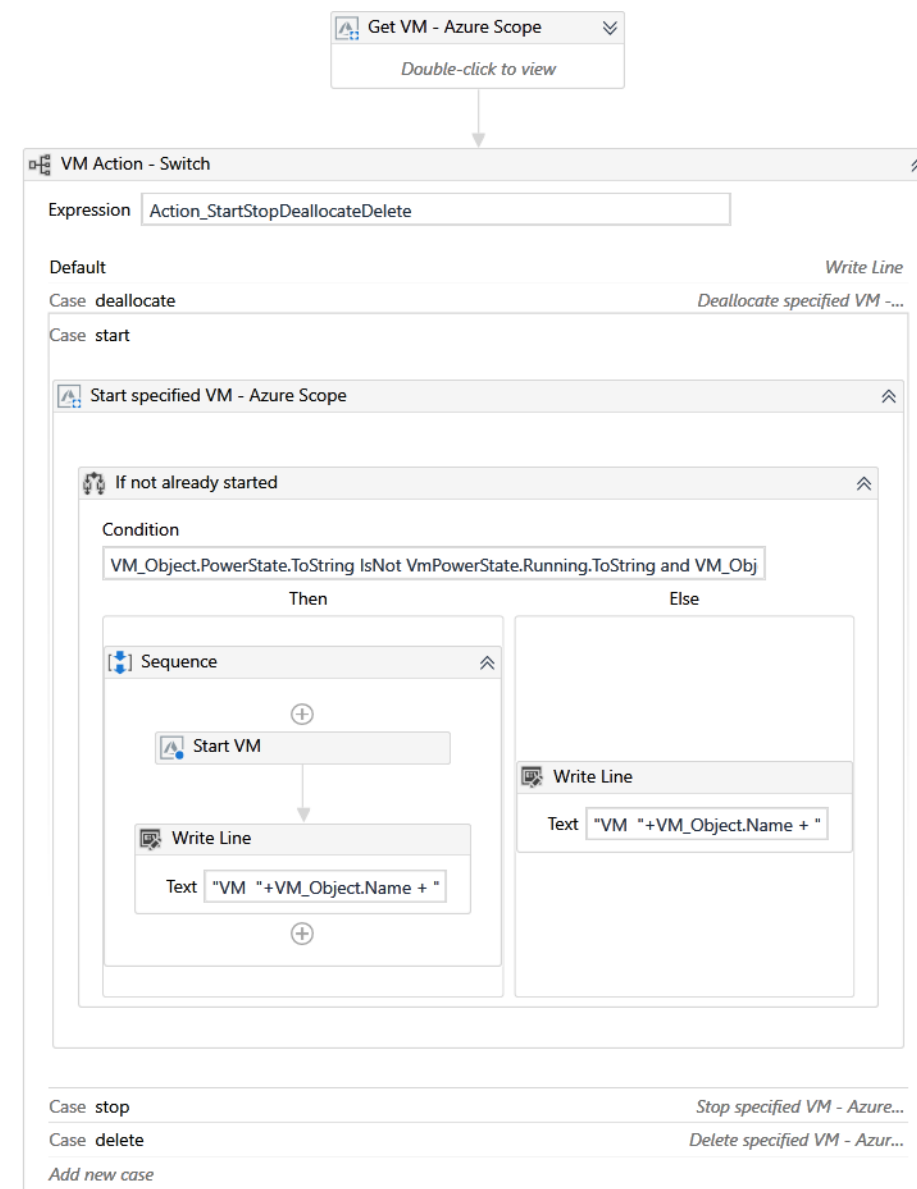
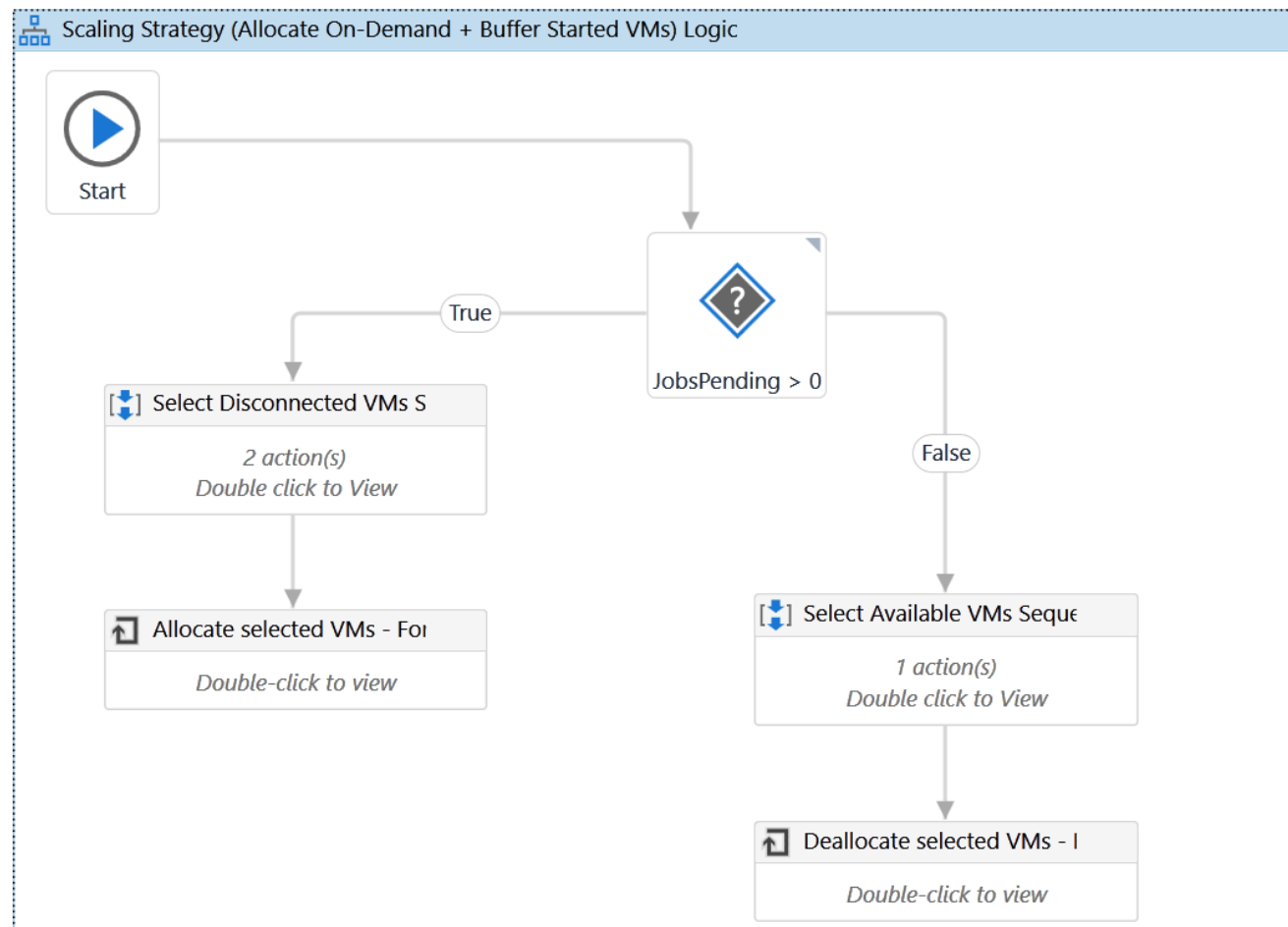
已置备的虚拟机
机器人已安装、注册
启动虚拟机
加载操作系统 (+ Robot svc)

按需分配

虚拟机配置
通过模板 (通过 UiPath, 预安装机器人)
启动虚拟机
加载操作系统 (+ Robot Svc)

机器人
就绪(t)

轻松定制改变流程工作流



Robots Autoscaling

工作流程



DB Clients Configs

RobotsCold	50
RobotsHot	10
Infrastructure	
Environment	RAS
Folder	Default
client_(x)	

RobotsCold	10
RobotsHot	2
Infrastructure	
Environment	E2
Folder	F2
client_1	

RobotsCold	80
RobotsHot	5
Infrastructure	
Environment	E1
Folder	F1
client_1	

Management Orchestrator

Queue. New Webhook Events

AUTOMATIONS	STATUS	REFERENCE	STARTED	ENDED
PROCESSES				
TRIGGERS				
QUEUES				
ASSETS				
STORAGE BUCKETS				
ACTIONS				
0 rows selected				
☐	Successful	job.completed_204_19619154	11 minutes ago	11 minutes ago
☐	Successful	job.created_204_19618580	11 minutes ago	11 minutes ago
☐	Successful	job.created_9351_94536657	13 minutes ago	13 minutes ago
☐	Successful	job.completed_204_19616011	40 minutes ago	40 minutes ago
☐	Successful	job.created_204_19615964	40 minutes ago	40 minutes ago

Jobs triggered by New Items

- 4.1 get event data for 1st new q. item
- 4.2 update all associated q. items
- 4.3 get the client info from the database
- 4.4 get the client state: jobs, robots, ..
- 4.5 select machines to start/stop & apply

MONITORING	PROCESS	ROBOT	ENVIRONM.	STATE	STA.	ENDED
ROBOTS						
JOB						
☐	ProcessQueueItems_RAS	AdminRobot1	RAS	Successful	a minute ago	a few seconds ago
☐	ProcessQueueItems_RAS	AdminRobot1	RAS	Successful	3 minutes a...	3 minutes ago

Webhook Events Receiver Service

Add Event
to Queue

tenant Id

folder Id

[...]

job.created

MONITORING	/ POC_DemoAWS_WF_RobotAutoScaling
ROBOTS	Search User: All State: All Priority: All Source: All
JOB	
QUEUES	
LOGS	
AUTOMATIONS	
PROCESSES	
TRIGGERS	
☐	PROCESS ROBOT MACHINE ENVIRONMENT STATE
☐	Fake Work T204F5031-R2 T204F5031-R2 RAS Pending
☐	Fake Work T204F5031-R3 T204F5031-R3 RAS Pending
☐	Fake Work Pending allocation RAS Pending
Items 10	

client_1 machines

			...	
M1	M2	M3		M(n)

DB Clients Configs

Client Configs

Client Name

Client Configs

RobotsCold50

RobotsHot10

Infrastructure

EnvironmentRAS

FolderDefault

client_(x)

...

RobotsCold10

RobotsHot2

Infrastructure

EnvironmentE2

FolderF2

client_1

RobotsCold80

RobotsHot5

Infrastructure

EnvironmentE1

FolderF1

client_1

Management Orchestrator

NAME ^	PROCESS	ENVIRONMENT
☐ ProcessQueueItems	ProcessQueueItems_RAS	RAS

1 Jobs started by scheduled trigger

- 2 get the client info from the database
- get the client state: jobs, robots, ..
- select machines to start/stop & apply

PROCESS	ROBOT	ENVIRONM...	STATE	STA...	ENDED
☐ ProcessQueueItems_RAS	AdminRobot1	RAS	Successful	a minute ago	a few seconds ago
☐ ProcessQueueItems_RAS	AdminRobot1	RAS	Successful	3 minutes a...	3 minutes ago

MONITORING

ROBOTS

JOBS

QUEUES

LOGS

AUTOMATIONS

PROCESSES

TRIGGERS

/ POC_DemoAWS_WF_RobotAutoScaling

Search

User: All

State: All

Priority: All

Source: All

PROCESS	ROBOT	MACHINE	ENVIRONMENT	STATE
☐ Fake Work	T204F5031-R2	T204F5031-R2	RAS	*** Pending
☐ Fake Work	T204F5031-R3	T204F5031-R3	RAS	*** Pending
☐ Fake Work	Pending allocation		RAS	*** Pending

client_1 machines

M1

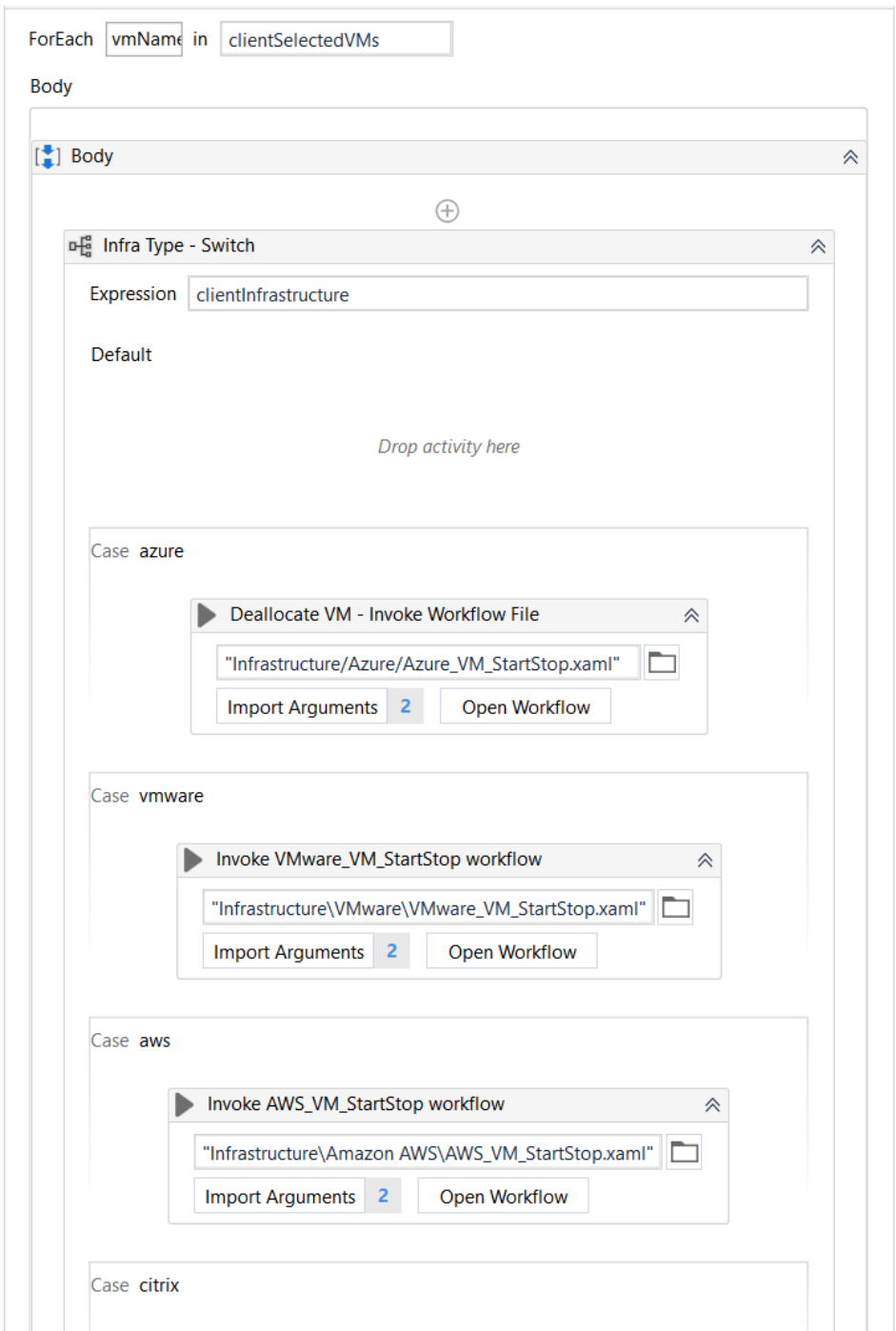
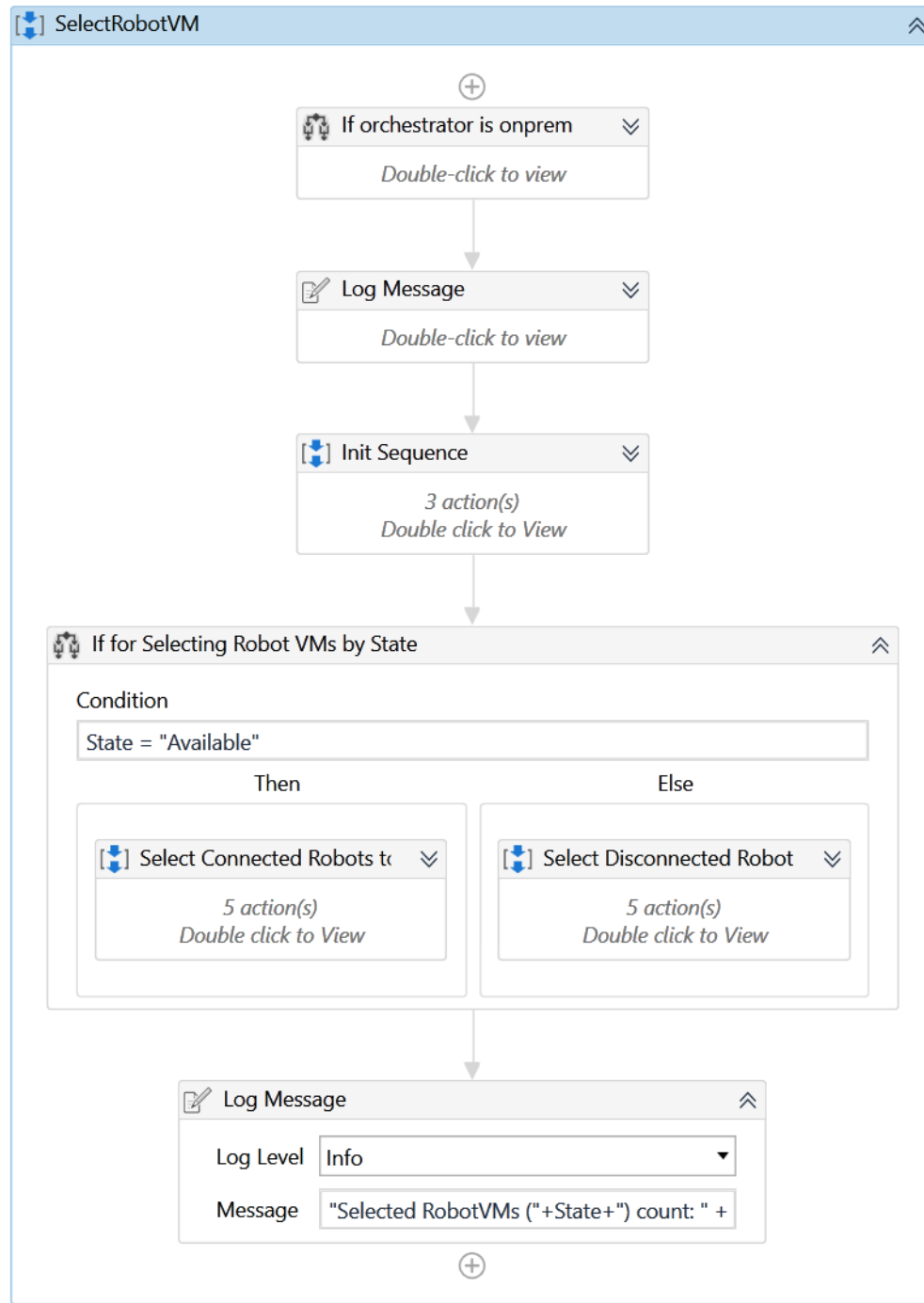
M2

M3

...

M(n)

client_1 jobs



Demo Time



Virtual machines - Microsoft Azure

portal.azure.com/#view/HubsExtension/BrowseResource/res...

Microsoft Azure

Search resources, services, and docs (G+)

Home

Virtual machines

UiPath (uipath.com)

+ Create + Switch to classic + Reservations + Manage view + Refresh + Export to CSV + Open query + Assign tags + Start

joyceVM

Subscription equals all Type equals all Resource group equals all Location equals all Add filter

No grouping List view

Name	Type	Subscription	Resource group	Location	Status	Operating system
JoyceVM-R1	Virtual machine	POC-EA	JoyceResourceGroup	East Asia	Stopped (deallocated)	Windows
JoyceVM-R2	Virtual machine	POC-EA	JoyceResourceGroup	East Asia	Stopped (deallocated)	Windows

< Previous Page 1 of 1 Next > Showing 1 to 2 of 2 records.

Give feedback

Processes - UiPath Orchestrator

cloud.uipath.com/Demo007/ACR_Test/orchestrator/_processes?tid=605&fid=128140&index=0&size=10&st...

UiPath Orchestrator

Tenant

My Folders

My Workspace

HR

RAS

Shared

joyce.wang@uipath.com...

Home Automations Monitoring Queues Assets Storage Buckets Testing

Processes Jobs Triggers Logs

Search

Columns Filters

+ Add process

Name	Version	Execution type	Compatibility	Entry point	Description	Labels	Properties
ACRTest	1.0.1	M... Unatten...	Window...	Main.xa...	空白流程		

1 - 1 / 1 Page 1 / 1 Items 10

Processes - UiPath Orchestrator

cloud.uipath.com/Demo007/ACR_Test/orchestrator/_processes?tid=605&fid=109572&index=0&size=10&state=M4ewTgPgZgUwDYBMoDsCGBbBUVxgIDGEd6UmwxAevQC...

UiPath Orchestrator

Tenant

My Folders

My Workspace

HR

IT

RAS

Shared

joyce.wang@uipath.com...

Home Automations Monitoring Queues Assets Storage Buckets Testing Settings

Processes Jobs Triggers Logs

Search

Columns Filters

+ Add process

Name	Version	Job p...	Execution type	Compatibility	Entry point	Description	Labels	Properties
ProcessClient	2.1.6	Medium	Unspecified	Windows - Leg...	Main.xaml	Process Client ...		

1 - 1 / 1 Page 1 / 1 Items 10



RPA Autoscaling客户案例

业务问题：客户是领先的税务提供商，在繁忙的税务季节面临与客户工作量相关的动态工作量。这导致了基础设施和人员方面的过度支出。

调整

- 截止日期事件导致每天工作负载需求增加 500-1000%
- 税收旺季，特别是税收结束请求，导致 RPA 作业（动态工作负载）激增
- 手动完成时效率非常低：IT 基础架构和管理成本增加
- 扩展需求从 10 台机器动态增加到 300 台机器，每台机器配备 10-20 台高密度机器人（白天平均 1500 台机器人，晚上平均 150 台机器人），全天候运行 24 / 7
- 为实时适应动态工作负载而导致高昂的维护成本、高昂的管理成本
- 错过 SLA 带来的更高风险 - 客户对客户和法律承诺承担数百万美元的潜在责任

解决方案

UiPath 提供了一个自动缩放解决方案..

- 通过分配/取消分配机器人机器来实时响应动态工作负载，以满足传入的 RPA 作业请求
- 适用于所有类型的基础架构（云、本地、混合）
- 使客户能够轻松、动态地调整自动缩放策略，以平衡成本节约与高可用性作业执行

预期成果



优化的 RPA 和业务运营
通过 IT 基础架构和人工降低成本



灵活部署
支持自定义 RPA 设置（高密度机器人、环境、Azure 云+本地 VMware）



绿色计算
通过运行更高效的 RPA 操作来节省能源



SLA 风险管理
在高度监管的税收环境中帮助满足客户和合同 SLA

预计节省

62% 每年基础设施成本的平均预期降低

73% 预计每年平均减少劳动力成本

64% 总成本的平均预期总体降低

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