OpenKasugai-Controller Attachment (CR/CM Specification)

■ Each CR/CM expression

■(resource name)

(Resource Description)

	Name	Туре	Req/Opt	Description
	Name	-	-	
metadata	Namespace	-	-	
	Regions	[]RegionInfo	Optional	
	Name	string	Required	
Spec	Туре	string	Required	
	Regions	[]RegionInfo	Optional	
Status	NodeName	string	Required	

Name : Parameter name
Type : Parameter type
Req/Opt : Required or Optional
Description : Parameter description

- $\leftarrow \text{Parameters containing the structure, or its map, list} \\ \leftarrow \text{RegionInfo element of structure (1)} \\ \leftarrow \text{RegionInfo element of structure (2)}$

- •The parameter group deviated by one step indicates that the parameter in the previous step is a structure and is an element of the structure.
 •For ConfigMap, data parameter replaces Spec/Status
 •Parameters in gray represent parameters that exist in CR/CM specification but are not used in the current implementation.

■ComputeResource

Custom resource containing information about the hard configuration and capacity management of each node. Indicates CPU, GPU, and FPGA information on the node.

Also has information about device capacity management

	Name	Туре	Req/Opt	Description
	Name	Туре	red/opt	"compute-"+ node name
metadata	Namespace			(specified by various resource controllers)
metadata	rumespace			Contains information about the smallest space on the physical device on that node.
	Regions	RegionInfo	Optional	As in FunctionTarget, the units described are divided regions on physical devices.
	Name	string	Required	Unique name given to the partitioned region on the physical devices.
	Type	string	Required	Region type
	DeviceFilePath	string	Required	Device file path of the device where this region is located
	DeviceUUID	*string	Optional	UUID of the device on which this region is located
	DeviceType	string	Required	Accelerator type
	DeviceIndex	int32	Required	Device Number
	Available	bool	Required	Availability of deployment destination
	Available	5001	rrequired	Deployment destination state
				Varies based on child bs write state for FPGA only, CPU/GPU is always fixed to "Ready."
				NotReady (No child bs) "NotReady " Preparing (Writing) Preparing
				, , , , ,
	0			Ready (with child bs) Ready
	Status	WBRegionStatus	Required	· Failed to prepare Error
				Maximum number of deployments (Number of functions = number of circuits, number of pods)
				When the FPGA bridge bs is in the unwritten/writing state, the following values are taken according to the correspondence
				state of automatic writing. (the same shall apply hereinafter)
				Enable child bs AutoWrite: nil
	MaxFunctions	*int32	Optional	· child bs does not support automatic writing: 0
	CurrentFunctions	*int32	Optional	Current number of deployments in the deployment destination
	MaxCapacity	*int32	Optional	Deployment destination Maximum Capacity (fps)
	CurrentCapacity	*int32	Optional	Current load on the deployment destination
	MaxTimeSlicingSeconds	*int32	Optional	Maximum value when time-sharing is used
	CurrentTimeSlicingSeconds	*int32	Optional	Current value when time-sharing is used
	Functions	[] functionInfrastruct	Optional	Deployed Function Information
	FunctionIndex	int32	Required	Serial number of the deployed function
	PartitionName	string	Required	Identity of the deployed function
	FunctionName	string	Required	Name of the deployed Function
	Available	bool	Required	Availability of Deployed Functions
				Maximum number of deployed Function DF (number of WBFunction).
	MaxDataFlows	*int32	Optional	Depend on the number of channels in the circuit
	CurrentDataFlows	*int32	Optional	Number of DF deployed functions currently installed (number of WBFunction)
	MaxCapacity	*int32	Optional	Maximum processing power of deployed functions (fps)
	CurrentCapacity	*int32	Optional	Current load of the deployed function (fps)
	MaxTimeSlicingSeconds	*int32	Optional	Maximum value when time-sharing is used
	CurrentTimeSlicingSeconds	*int32	Optional	Current value when time-sharing is used
Spec	NodeName	string	Required	worker node name
	Regions	RegionInfo	Optional	Contains information about the smallest space on the physical device on that node. Suppress Parameters
Status	NodeName	string	Required	worker node name

■ Function Target

custom resource that has information about the candidate locations for functions built from ComputeResource

Body: It represents information in regions such as Lane, PR and GPU. Number of available circuits/pods and processing performance

Functions: Represents information about the circuits and pods deployed on the region.

Maximum number of DF circuits or pods that can be installed, and processing performance per circuit or pod

	Name	Туре	Req/Opt	Description
				Name the node device region
				Assumptions generated from ComputeResource's corresponding regionInfo data
	Name	-	-	<node>. <devicetype>-<deviceindex>. <region> etc.</region></deviceindex></devicetype></node>
metadata	Namespace	-	-	(specified by various resource controllers)
	ComputeResourceRef	WBNamespacedName	Required	ComputeResource Resource Name and Namespace
	Name	string	Required	
Spec	Namespace	string	Required	
	RegionName	string	Required	Unique name given to the partitioned region on the physical device
	RegionType	string	Required	Region type
	NodeName	string	Required	worker node name
	DeviceType	string	Required	Accelerator type
	DeviceIndex	int32	Required	Device Number
	Available	bool	Required	Availability of deployment destination (minimum space such as Lane or gpu)
				State of the deployment destination (minimum space such as Lane or gpu)
				Varies based on child bs write state for FPGA only. CPU/GPU is always fixed to "Ready."
				NotReady (No child bs) "NotReady "
				Preparing (Writing) Preparing
				Ready (with child bs) Ready
	Status	WBRegionStatus	Required	Failed to prepare Error
				Maximum number of deployments (Number of circuits, number of pods), maximum number of Functions
				When the FPGA bridge bs is in the unwritten/writing state, the following values are taken according to the
				correspondence state of automatic writing. (the same shall apply hereinafter)
				Enable child bs AutoWrite: nil
	MaxFunctions	*int32	Optional	· child bs does not support automatic writing: 0
	CurrentFunctions	*int32	Optional	The current load of the deployment destination. Current Functions Count
	MaxCapacity	*int32	Optional	The maximum processing power (fps) of the deployment destination
	CurrentCapacity	*int32	Optional	Current load to deploy to (fps). Sum of all Functions.CurrentCapacity
	Functions	[] functionstruct	Optional	Information about deployed functions (circuits and pods)
	FunctionIndex	int32	Required	Serial number of the deployed function
	FunctionName	string	Required	Name of the deployed Function
	Available	bool	Required	Availability of Deployed Functions
	MaxDataFlows	*int32	Optional	Maximum number of deployed Function DF (number of WBFunction). It depends on the number of channels of the
	CurrentDataFlows	*int32	Optional	Number of DF deployed functions currently installed (number of WBFunction)
	MaxCapacity	*int32	Optional	The maximum processing power (fps) of the deployed Function. It depends on the circuit and pod implementation.
	CurrentCapacity	*int32	Optional	Current load of the deployed function
	MaxTimeSlicingSeconds	*int32	Optional	
Status	CurrentTimeSlicingSeconds	*int32	Optional	

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custom resource with information about the configuration (function and connection specifications) and requirements (expected load) of data flow you want to deploy

	1			
	Name	Туре	Reg/Opt	Description Be set by the user
				Since the value of this parameter is part of WBFunction's metadata.name, the length must satisfy the character limit of WBFunction's metadata.name.
				[Reference] Character limit for the name of the function (FC Functions key value) prepared in the sample data and the name of DataFlow that uses the
				following function (value of this parameter). In the prepared sample data, the maximum length of the function name (filter-resize-high-infer-main) is characters, so in this case, DataFlow name must be within 14 characters.
				· Advanced CPU filter/resize: fiter-resize-high-infer-main (29 characters) * DataFlow name must be 14 characters or less
				Lightweight CPU filter/resize: fiter-resize-low-infer-main (28 characters) * DataFlow name must be 15 characters or less
				CPU decode: decode-main (11 characters) # DataFlow name must be no more than 32 characters. CPU copy branch: copy-branch-main (16 characters) * DataFlow name must be 27 characters or less
				CPU copy branch: copy-branch-main (1b characters) * DataFlow name must be 27 characters or less CPU glue: glue-fdma-to-tco-main (21 characters) # DataFlow name must be no more than 22 characters.
				GPU advanced inference: high-infer-main (15 characters) * DataFlow name must be 28 characters or less
	Name	-	-	· GPU advanced inference: low-infer-main (14 characters) * DataFlow name must be 29 characters or less
etadata	Namespace	-	-	Be set by the user Name and Namespace of FunctionChain where the deployment will take place
	FunctionChainRef Name	WBNamespacedName string	Required Required	Name and Namespace of FunctionChain where the deployment will take place
	Namespace	string	Required	
	DryRun	*bool	Optional	Used to pre-validate deployments (future features)
	StartPoint	*StartEndPoint	Optional	Set Start Point
	Stattront	StattLiuront	Optional	IP address of the starting point
	IP	string	Required	If set, WBConnection params with From "wb-start-of-chain" will be set to a value with a key of "TargetIP"
	Port	int32	Required	Port number of the starting point If set, WBConnection params with From "wb-start-of-chain" will be set to a value with a key of "TargetPort"
	Polt	IIII32	required	Protocol at the starting point
				corev1.Protocol is a string of "TCP," "UDP," or "SCTP." You may define your own strings
	Protocol	corev1.Protocol	Required	If set, WBConnection params with From "wb-start-of-chain" will be populated with key "Protocol"
	EndPoint	*StartEndPoint	Optional	Set End Point IP address of the endooint
	IP	string	Required	If set, WBConnection params with To "wb-end-of-chain" will be set to a value with a key of "TargetIP"
				Port number of the endpoint
	Port	int32	Required	If set, WBConnection params with To "wb-end-of-chain" will be set to a value with a key of "TargetPort"
				Protocol at the end point corev1.Protocol is a string of "TCP," "UDP," or "SCTP." You may define your own strings
	Protocol	corev1.Protocol	Required	If set, WBConnection params with To "wb-end-of-chain" will be set to a value with a key of "Protocol"
	FunctionUserParameter	[]FunctionParamStruct	Optional	User defined parameters for each function # This parameter overwrite FunctionChain CustomParameter.
	FunctionKey UserParams	string map[string]intstr.IntOrString	Required Required	key value in DataFlowStatus. FunctionChain .FunctionChainSpec.Functions map key is the user-defined parameter name. The value of map is the value of a user-defined integer/string parameter.
	USEIT didilis	map(sumg)mistr.intUrString	required	map key is the user-defined parameter name. The value of map is the value of a user-defined integer/string parameter. User-defined parameters per connection
	ConnectionUserParameter	[]ConnectionParamStruct	Optional	*This parameter overwrite FunctionChain's CustomParameter.
	From	FromToFunctionInfo	Required	Source Function Information in Connection
	FunctionKey To	string FromToFunction	Required Required	Destination Function in Connection. key of Dataflow.Status. FunctionChain .Spec.Functions is set Destination Function information in Connection
	FunctionKey	FromToFunctionInfo	Required	Destination Function in Connection in Connection Destination Function in Connection. Key of Dataflow.Status. FunctionChain .Spec.Functions is set
				map key is the user-defined parameter name.
	UserParams	map[string]intstr.IntOrString	Required	The value of map is the value of a user-defined integer/string parameter.
	FunctionTargetSelectors FunctionKey	[]FunctionTargetSelector string	Optional Required	If the user specifies where the Function is deployed Function to which the user specifies to deploy. FunctionChain.FunctionChainSpec.Functions key value
	NodeName	*string	Optional	Name of the Node to deploy to
	DeviceType	*string	Optional	DeviceType of the deployment destination
	DeviceIndex	*int32	Optional	DeviceIndex of the deployment destination
	RegionName	*string	Optional	Minimum space on the device to which it is deployed
	FunctionIndex	*int32	Optional	If you want to reuse a deployed function, set the serial number of the deployed function on the smallest region of the destination device. If you are deploying a new function, do not set it.
				List the requirements that must be met at scheduler
	Requirements	*DataFlowRequirementsStruct	Optional	Requirements can be specified in units of entire function chain, one function, or one connection.
	All Capacity	*AllRequirementsInfo int32	Optional Required	List requirements for function chain as a whole (function chain requirements are assumed to be one factor maximum) Each connection and the amount of load assumed by each connection (fps). (each connection and the amount of resources required for each connection)
	Functions	111.02	Optional	Describe the requirements for each function that makes up function chain
	FunctionKey	string	Required	key value in DataFlowStatus. FunctionChain.FunctionChainSpec.Functions
	Canacity	in/32	Parvisor	Estimated load by this function (fps) (Recourse conscitutes for this function (proceeding newer consumed by this function))
	Capacity Connections	int32 []ConnectionRequirementsInfo	Required	(Resource capacity required for this function (processing power consumed by this function)) Describe the requirements for each connection that makes up function chain
	From	FromToFunctionInfo	Required	Source Function Information in Connection
	FunctionKey	string	Required	Destination Function in Connection, key of Dataflow.Status. FunctionChain .Spec.Functions is set
	To FunctionKey	FromToFunction FromToFunctionInfo	Required Required	Destination Function information in Connection Destination Function in Connection, key of Dataflow.Status. FunctionChain .Spec.Functions is set
	runctionicey	Tront of discontinu	-veduited	Destination Function in Connection, key of Datatlow.Status. FunctionChain .Spec.Functions is set Estimated load from this connection (fps)
1	Capacity	int32	Required	(amount of resources required for this connection)
ec	Capacity UserRequirement	int32 *string	Required optional	(amount of resources required for this connection) Specifies metadata.name of UserRequirement ConligMap to be referenced to obtain various configuration information for DataFlow scheduling
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■SchedulingData custom resource with information on DataFlow's candidate fleet

	Name	Type	Rea/Opt	Description
	Name	-	-	WB scheduler controller sets the same value as metadata.name in DataFlow
metadata	Namespace	-		WB scheduler controller sets the same value as metadata.namespace in DataFlow
	FilterPipeline	string	Required	Slice of the filter name to use
				The state of SchedulingData. The following three patterns.
				(1) "Filtering": Filtering in progress
				(2)"Finish": Finished filtering
	Status	string	Required	(3)"Failed" — Filtering operation failed.
	CurrentFilterIndex	*int32	Optional	Current Filter Number
	TypeCombinations	[]TypeCombinationStruct	Optional	Function DeviceType, ConnectionType, Score slices
	DeviceTypes	map[string]string	Optional	slice of DeviceType
	ConnectionTypes	ConnectionTypes	Optional	ConnectionType slices
	Score	*int64	Optional	Slicing Score
	TargetCombinations	[]TargetCombinationStruct	Optional	Slice of potential DataFlow locations
				(set by the filter specified in filterPipeline)
	ScheduledFunctions	map[string]FunctionScheduleInfo	Optional	Key is set to a key value of DataFlowStatus. FunctionChain .FunctionChainSpec.Functions
	NodeName	string	Required	NodeName of the candidate schedule destination of the Function
	DeviceType	string	Required	DeviceType of the candidate schedule destination of the Function
	DeviceIndex	int32	Required	DeviceIndex of the candidate schedule destination of the Function
	RegionName	string	Required	Minimum space on the device to which a candidate schedule a Function is deployed
	FunctionIndex	*int32	Optional	FunctionIndex of the candidate schedule destination of the Function
	ScheduledConenctions	[]ConnectionScheduleInfo	Optional	(set by the filter specified in filterPipeline)
	From	FromToFunctionScheduleInfo	Required	Source Function information in the connection of the schedule destination candidate
	FuntionKey	string	Required	Source Function in Connection. key value of Dataflow.Status. FunctionChain .Spec.Functions is set
	Port	*int32	Optional	Output port number of data source Function (0 is specified when Function is 1 output)
	InterfaceType	*string	Optional	Interface type of output used by the sender Function (From function) in this connection
	To	FromToFunctionScheduleInfo	Required	Destination Function information in the connection of the schedule destination candidate
	FuntionKey	string	Required	Destination Function in Connection, key value of Dataflow, Status, FunctionChain, Spec, Functions is set
	Port	*int32	Optional	Output port number of the data destination Function (if Function is 1 output, specify 0)
	InterfaceType	*string	Optional	Input interface type used by the destination Function (To function) in this Connection
Status	Socre	*int64	Optional	Score for DataFlow deployment candidates

■FunctionType

custom resource representing a Function available in function chain

	Name	Туре	Req/Opt	Description
	Name	-	-	Be set by the user
metadata	Namespace	-	-	Optional by the user (specified by the administrator according to the function's template category)
	FunctionName	string	Required	The function name in the function catalog. Value to be set for FunctionName in FunctionChain
	FunctionInfoCMRef	WBNamespacedName	Required	
	Name	string	Required	Specifies the metadata.Name of FunctionInfo (ConfigMap) where the FunctionName function is defined
	Namespace	string	Required	Specifies the metadata. Namespace of FunctionInfo (ConfigMap) where the FunctionName function is defined
Spec	Version	string	Required	The version of the Function. Used to ensure uniqueness with Name+Version
	Status	string	Required	Function Availability (Ready/Not Ready/Error)
	RegionTypeCandidates	[]string	Optional	Candidate RegionType used when FunctionType is deployed
				Stores the recommended connection for each RegionType
Status	RecommendConnection	[]string	Optional	Stores the value from FunctionInfo.FunctionInfoRecommend.DeviceType in the format <devicetype><interface></interface></devicetype>

■FunctionInfo (ConfigMap)
information equivalent to function catalog information

	Name	Type	Reg/Opt	Description
netadata	Name	-	-	"funcinfo-"+ function name
				Be set by the user
	Namespace	-	-	(Assumptions specified by the administrator according to function catalog categories, etc.)
ata	deployableItems	string	Required	A string value of an array whose elements are json objects consisting of the following key-values:
	name	string	Required	A name that refers to an element in the deployableItems array.
	regionType	string	Required	Deployable region type
The data	inputInterfaceType	string	Required	Interface type of input available when deployed to the above <regiontype></regiontype>
eld value				Interface type of output available when deployed to the above <regiontype>. The following three interface type values can be set.</regiontype>
of type				"dev25gether" (Interface type used by functions running on the FPGA for external connection via the NIC of the FPGA)
ap				· "host100gether"(Interface type used by functions running on GPUs for external connections via host NICs)
tring]	outputInterfaceType	string	Required	- "mem" (Interface type used by functions running on an FPGA, GPU, or CPU for connection via shared memory)"
tring	configName	string	Required	Name of information required for deployment when deploying to <regiontype> above and using <input interfacetype=""/> and <output interfacetype=""> and <output inte<="" td=""></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></output></regiontype>
ConfigMa	specName	string	Required	Name of the function spec information when deployed to < regionType> above and using <inputinterfacetype> and <outputinterfacetype> above</outputinterfacetype></inputinterfacetype>
				Specification information for the function
ecificati	spec	string	Required	A string value of an array whose elements are json objects consisting of the following key-values:
i).	name	int32	Required	A name that refers to an element of the spec array.
	minCore	int32	Required	The minimum value of the resource to use. Currently always assumes "1"
	maxCore	int32	Optional	The maximum value of the resource to use. Currently always assumes "1"
	maxDataFlowsBase	int32	Optional	Base maximum percentage DataFlow (maximum installed WBFunction). Depend on the number of channels in the circuit
	maxCapacityBase	int32	Optional	Base Max Processing Power (fps)
	maxinputNum	Int32	Optional	Maximum number of function inputs
	maxOutputNum	int32	Optional	Maximum number of outputs of the function
	latencyBase	string	Optional	Base delay time, units (ms, us) available
	latencySizeScale	string	Optional	Change in delay time by DataSize
	latencyCoreScale	string	Optional	Variation of delay time with number of resources
	perfBase	string	Optional	Base throughput, units (Byte/sec, MiB/sec) available
	perfSizeBase	string	Optional	Throughput change with DataSize
	perfCoreBase	string	Optional	Throughput Variation with Number of Resources
	powerBase	string	Optional	Basic power consumption, units (mW, W) available
	powerSizeBase	string	Optional	Power consumption change by DataSize
	powerCoreBase	string	Optional	Power consumption variation with number of resources
				The recommended deployableItem (the destination region type & the set of available I/O interface types). Multiple settings allowed
	recommend	string	Optional	A string value of an array whose elements are json objects consisting of the following key-values.
	deployableItemName	string	Required	deployableItem name

■Strategy (ConfigMap)

A configmap that specifies the execution strategy of the filter in DataFlow scheduling

	Name	Туре	Req/Opt	Description
metadata	Name	-	-	Be set by the user
	Namespace	-	-	Set the same value as DataFlow's metadata.namespace or "default"
data	referenceParameter	string	Optional	Specify metadata. Name of ConfigMap to reference for setting strategy
*The data	filterPipeline	[]string	Optional	Array of Filter names to use
field value	selectTop	int	Optional	Get up to < set value > th score of filtering results
is of type				where <n> is the index number of the filter specified for filterPipeline.</n>
map	<n>.referenceParameter</n>	string	Optional	For the <n> th filter in filterPipeline, specify the metadata.Name of the ConfigMap to reference for setting the strategy.</n>
[string]				where <n> is the index number of the filter specified for filterPipeline.</n>
string	<n>.selectTop</n>	int	Optional	Get up to the < set value > th Score of the filter result of the <n> th filterPipeline Scorefilter</n>
(ConfigMap				where <n> is the index number of the filter specified for filterPipeline.</n>
specificatio	<n>.<parametername></parametername></n>	T	Optional	Specify any user-defined value for the <n> th filter.</n>

■ FunctionChain

Resource for representing Dataflow configuration. Combining FunctionType and ConnectionType

	Name	Туре	Reg/Opt	Description
	Name	-	-	Be set by the user
metadata	Namespace	-	-	Optional by the user (specified by the administrator according to the FC template category)
	FunctionTypeNamespace	string	Required	FunctionType Namespace
	ConnectionTypeNamespace	string	Required	ConnectionType Namespace
				A map of the Functions that make up FunctionChain, key is the function identifier specified in Connections From or To
				(A string that is unique in this FunctionChain resource. The string to be used in each CR FunctionKey)
				Since the map key value (Function identifier) of this parameter is part of WBFunction's metadata.name, the number of characters must satisfy the
	Functions	map[string]FunctionStruct	Required	character limit of WBFunction's metadata.name.
	FunctionName	string	Required	
	Version	string	Required	FunctionTypeSpecify the Name, Version defined in Spec. In the future, we want Version to support equal and not equal signs.
	CustomParameter	map[string]intstr.IntOrString	Optional	Define the settings to be given to the Function
	Connections	[]ConnectionStruct	Required	List of Connections that make up FunctionChain
	From	FromToFunction	Required	Source Function Information in Connection
	FunctionKey	string	Required	Identifier of the data source Function. Set Functions map key value
	Port	int32	Required	Output port identification number of the data transmission source Function (If Function is 1 output, specify 0)
	To	FromToFunction	Required	Destination Function information in Connection
	FunctionKey	string	Required	Identifier of the data destination Function. Set Functions map key value
	Port	int32	Required	Input port identification number of the data transmission destination Function (If Function is 1 input, specify 0)
	ConnectionTypeName	string	Required	Specify resource name or "auto" for ConnectionType. Currently always assumes "auto"
Spec	CustomParameter	map[string]intstr.IntOrString	Optional	Defines the settings to be given to Connection
Statue	Status	string	Required	FunctionChain Availability (Ready/Not Ready/Front)

■UserRequirement (ConfigMap)
Strategy configuration maps used for DataFlow scheduling and configuration maps that specify filtering conditions for function/connection deployment destinations

				T
	Name	Туре	Req/Opt	Description
metadata	Name	-	-	Be set by the user
	Namespace	-	-	Set the same value as DataFlow's metadata.namespace or "default"
data	strategy	string	Required	Specify metadata.name in Strategy's ConfigMap.
*The data	scoreThreshold	map[string]string	Optional	Score threshold for each score type (currently unused)
field value				Specify a function to be deployed to the same Node.
is of type				The outer slice value is the NodeName to deploy to.
map	nodeGroups	[][]string	Optional	The values in the inner slice are key values from FunctionChain .FunctionChainSpec.Functions.
[string]				Specify the NodeName to which the function specified in the map key is to be deployed or not deployed.
string				The key of map is the key value of FunctionChain .FunctionChainSpec.Functions that indicates the Function.
(ConfigMa	requestNodeNames	map[string][]string	Optional	The value of map is an array of NodeNames. ' - 'designates it as non-deployable.
p				Specify the DeviceType of the deployment destination/non-deployment destination of the function specified in the map
specificatio				key.
n).	requestDeviceTypes	map[string][]string	Optional	The key of map is the key value of FunctionChain .FunctionChainSpec.Functions that indicates the Function.
				The map key is the index number (specified as a string) in FunctionChain.
	requestConnectionTypes	map[string][]string	Optional	The value of map is an array of ConnectionSideType. ' - 'is specified as an exclusion target.
				Specifies FunctionTarget to which the function specified in the map key is to be deployed or not deployed.
				The key of map is the key value of FunctionChain .FunctionChainSpec.Functions that indicates the Function.
	requestFunctionTargets	map[string][]string	Optional	The map value is an array of FunctionTarget.' - 'designates it as non-deployable.
				The map key is the index number (specified as a string) in FunctionChain.
	requestConnectionTargets	map[string][]string	Optional	The value of map is an array of ConnectionTypeName. ' - 'is specified as an exclusion target.
				Specify the RegionName of the deployment-destination or non-deployment-destination of the function specified in the
				map key.
				The key of map is the key value of FunctionChain .FunctionChainSpec.Functions that indicates the Function.
	requestRegionNames	map[string][]string	Optional	The value of map is an array of RegionName. ' - 'designates it as non-deployable.
				Specifies the FunctionIndex to which the function specified in the map key is to be deployed or not deployed.
				The key of map is the key value of FunctionChain .FunctionChainSpec.Functions that indicates the Function.
	requestFunctionIndexes	map[string][]string	Optional	The value of map is an array of FunctionIndex. ' - 'designates it as non-deployable.
	functionTargetNameSpace	string	Optional	Specifies the metadata.namespace of FunctionTarget to be referenced when executing a Filter that uses device
	connectionTargetNameSpace	string	Optional	Specify metadata.namespace for ConnectionTarget
	topologyInfoName	string	Optional	Specify metadata.Name of the TopologyInfo to be referenced when executing a Filter that uses topology information
		-		Specifies the metadata.Namespace of the TopologyInfo to be referenced when executing a Filter that uses topology
	topologyInfoNameSpace	string	Optional	information
<u> </u>		- · · · · · · · · · · · · · · · · · · ·		+

Name Controlled Controlled	Name	Туре	Req/Opt	Description
None Section	Turnic .	1780	noq opt	
Management Mills				Character limit: Adjust the key value of metadata.name in DataFlow (DF) and Functions in Function
Double D		-	-	
Memory More Management	<u> </u>	-	-	
Management				Identify Original Dataflow
Noahame string Request Marked Secretary Mar		-		
Nous-Section Desiration Control Contro				
Desiron Desi				
Decisionaries Stock				
Disciplination Settle Commission Registration Settle Commission Registration Procession Processi			-	Destination Device Type
Designate functions on the destination. If this parameter in any exercise, and edulyment in requested. If this parameter is not present, it means that the destination of the circuit or pod corresp the control of the parameter is present, it means that the destination. Practicionidade 1979. Practicionidade 1979.				**
TructionIndex **A012** Optional See Datafier Functions with that FunctionIndex **A012** Optional See Datafier FunctionSee with that FunctionIndex **A012** Optional See Datafier Function Index **A012** Object The Property of See Datafier Function Index **A012** Object The Property Option Index **A012** Object The Property Option Index **A012** Optional See Datafier Function Index **A012** Optional See Datafie	RegionName	string	Required	Deployment destination. Add the Region parameter for FunctionTarget
Functioninates Procession Services Procession				If this parameter is not present, a new deployment is requested.
FuestionName with Sing Special Security Configuration and Security Configur				
ConfigName Strong Sequence ConfigName Sequence Sequence	FunctionIndex	*int32	Optional	
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		W/P Eupotion Populsom on to Info	Ontional	
	SatisfiedRequirements			

custom resource for the Connection to deploy, custom resource of either EthernetConnection or PCIeConnection is made based on the information of this custom resource.

	Name	Туре	Req/Opt	Description
				<metadata.name df="" in="">-wbconnection-<fc connections="" from="">-<fc connections="" to=""></fc></fc></metadata.name>
	Name	-	-	(Based on the review of the first edition)
metadata	Namespace	-	-	(specified by DF controller)
	DataFlowRef	WBNamespacedName	Required	Identify Original Dataflow
	Name	string	Required	
	Namespace	string	Required	
	,			How From and To are connected. If auto, the connection is chosen as determined by the deploy destination on both ends.
				Note that each ConnectionController does not support auto, and the ConnectionWebhook replaces the Type.
	ConnectionMethod	string	Required	Currently, it stores information indicating whether it is an outer connection or an inner connection ("host-100gether," "host-mem").
	ConnectionPath	[]WBConnectionPath	Optional	Path information between FromFunction and ToFunction (The value of ConnectionPath parameter of ScheduledConnections in DataFlow is stored as is.)
	EntityID	string	Required	Path information between FromFunction and ToFunction (The value of the EntityID parameter for each element of ConnectionPath in DataFlow's ScheduledConnections is stored as is.)
	UsedType	WBIOUsedType	Required	Path information between FromFunction and ToFunction (The value of the UsedType parameter for each element of ConnectionPath in DataFlow's ScheduledConnections is stored as is.)
	From	FromToWBFunction	Required	Connection source WRFunction information
	WBFunctionRef	WBNamespacedName	Required	Resource name and namespace of the connection source WBFunction. In the case of a DataFlow starting point, it is a reserved word to indicate an external connection.
	Port	int32	Required	Output port number (interface identification number) of the connection source WBFunction
	То	FromToWBFunction	Required	Deployment destination WPFunction information
	WBFunctionRef	WBNamespacedName	Required	Resource name and namessace of WBFunction to connect to. In the case of an DataFlow endooint, a reserved word is used to indicate an external connection.
	Port	int32	Required	Resource name and namespace of with runcion to connect to. In the case of an Latar-low engopoint, a reserved word is used to indicate an external connection. Input port number (interface identification number) of the connection destination WBF incition.
	Params Requirements	map[string]intstr.IntOrString *WBConnectionRequirementsInf	Optional	Integer/String Parameters
c			Optional	The topology information controller uses this parameter to update the topology information device interface usage and network usage in declared value base.
Spec	Capacity	int32	Required	Indicates the assumed load on the device interface and network for the connection between FromFunction and ToFunction. This term, the unit of assumed load is treated as fps.
	DataFlowRef	WBNamespacedName	Required	Identify Original Dataflow
				Deploy state for the entire connection. following seven patterns
				(1)": * Currently not used
				(2)"Falled": * Currently not used
				(3)"Allocated": * Currently not used (4)"Deployed" — Deployed
				(5) "Walting" — Deploying (6) "Released": * Currently not used
	Status	WBDeployStatus	Required	(d) Neiraster C. Teneraty included (27) Teneraty included (27) Tenerating C. Carrotter (27) Tenerating
	ConnectionMethod	string		
	ConnectionPath	[]WBConnectionPath	Required Optional	Type of connection deployed Path Information between FromFunction and ToFunction for deployed connections (The value of ConnectionPath parameter of ScheduledConnections in DataFlow is stored as is,)
	ConnectionPatri	[]WBConnectionPatri	Optional	yearn information between From runction and for unction for deployed connections (in evalue or connections an parameter or Scientific Connections in Data-Flow's Extensional Connection and Flow or Connection
	EntityID	string	Required	Fact information between From Function and To Function for deployed connections (The Value of the Entity ID parameter for each element of ConnectionPath in DataFlow's ScheduledConnections is stored as is.)
	EnutyID	string	Required	Scineauequomentorisis is stored as its.) Path information between FromFunction and ToFunction for deployed connections (The value of the UsedType parameter for each element of ConnectionPath in DataFlow's
	UsedType	WBIOUsedType	Required	Fact information between Profit function and structure of the profit of the value of the disease
	From	FromToWBFunction	Required	Surrequeoconnections is stored as is.)
	WBFunctionRef	WBNamespacedName	Required	Deployment source Function resource name
	Port	int32	Required	Deproyment source runction resource name Output port number of the connection source Function
				Dutput port number or the connection source Function
	То	FromToWBFunction	Required	
	WBFunctionRef	WBNamespacedName	Required	Connection destination Function resource name
	Port	int32	Required	Input port number of the connection destination Function
	Params	map[string]intstr.IntOrString	Optional	Integer/String Parameters
	SatisfiedRequirements	*WBConnectionRequirementsInf		The topology information controller uses this parameter to update the topology information device interface usage and network usage in declared value base.
	Capacity	int32	Required	Indicates the assumed load on the device interface and network for the connection between FromFunction and ToFunction. This term, the unit of assumed load is treated as fps.
	IOs	map[string]WBConnectionIO	Optional	I/O information used during deploy
	Status	string/WBDeployStatus	Required	Deploy state of this I/O
	ІоТуре	string/WBIOType	Required	Direction of I/O used (Incoming/Outgoing from Device perspective)
	Node	string	Required	Name of the Node to which I/O will be deployed
	DeviceType	string	Required	Deployment destination I/O DeviceType
	DeviceIndex	int	Required	Deployment destination I/O Device number
	IoName	string	Required	I/O name to use
	Port	int	Required	I/O port number to use
			Optional	integer parameter
	IntParams	map[string]int	Optional	
		map[string]int map[string]string	Optional	string parameter
	IntParams			
	IntParams StrParams	map[string]string	Optional	string parameter
	IntParams StrParams Connections	map[string]string []WBConnectionEdge	Optional Optional	oring parameter SubConnection when the connection between Functions is braken down according to the parallarity of resource management Deploy state of this SubConnection
	IntParams StrParams Connections Status	map[string]string []WBConnectionEdge string/WBDeployStatus	Optional Optional Required	String parameter SubConnection when the connection between Functions is broken down according to the granularity of resource management
	IntParams StrParams Connections Status From	map[string]string []WBConnectionEdge string/WBDeployStatus WBNamespacedName	Optional Optional Required Required	stding parameter SubConnection when the connection between Functions is broken down according to the granularity of resource management Deploy state of this SubConnection Connection source name (Function, U.O)
Status	IntParams StrParams Connections Status From To	map[string]string []WBConnectionEdge string/WBDeployStatus WBNamespacedName WBNamespacedName	Optional Optional Required Required Required	shing assumeter Sockcomestics when the connection between Functions is broken down according to the paraularity of resource management Oppley state of this SubConnection Commentor source name (Function, U.O) Commentor source name (Function, U.O) Commentor of states of marking (U.O)

■GPUFunction

custom resource with information about the Function to deploy to the GPU

custom resource with information about the Function to deploy to the GPU

There is advanced inference/lightweight inference using Gaterine as a sample processing module. The connection method assumes PCIe connection from the FPGA and TCP connection from the CPL

Converted from WBFunction and auto-generated

	Nar	me	Туре	Req/Opt	Description
netadata	Nar		-	-	Be set by the user
ietauata		mespace	-	-	Be set by the user
	Dat	taFlowRef	WBNamespaecedName	Required	Identify original Dataflow (Equivalent to the parent CR WBFunction .spec.DataFlowRef)
		nctionName	string	Required	Name of the Function to execute (Equivalent to the parent CR WBFunction.spec.FunctionName)
	Noc	deName	string	Required	Destination node name (Equivalent to the parent CR WBFunction.spec.NodeName)
	Dev	viceType	string	Required	Destination Device Type (Equivalent to the parent CR WBFunction.spec.DeviceType)
	Ann	celeratorIDs	Dr. ini (Required	The identity of the destination device (considering the possibility of assigning more than one device to a
	ncc	zeletaturius	[]AccIDInfo	rtequired	GPUFunction in the future)
		PartitionName	-4-7	Demind	Information identifying the Function to which the accelerator is to be assigned (container name in the case
		PartitionName	string	Required	GPUFunction)
		ID	string	Required	Identifier of the accelerator to assign to the function (in the case of GPUFunction, the UUID of the GPU)
	Reg	gionName	string	Required	Distinguished name of the deployment region to which it is deployed
					Deployed functions on the destination (Equivalent to the parent CR WBFunction.spec.RegionName)
					(for GPUFunction, the ld of the deployed Pod)
	Fun	nctionIndex	*int32	Optional	If this parameter is not present, it means that a new deployment is requested.
					If this parameter is present, it means that the dataflow should be stored in the circuit or pod corresponding
					the already deployed Functions with that FunctionIndex.
	Env	/S	[]EnvsInfo	Optional	For setting parameters for the processing module. Copied to the pod's containers.env (for each container)
		PartitionName	string	Required	Information identifying the function to pass this argument to (container name for GPUFunction)
	l	EachEnv	[]EnvsData	Required	List with information for each environment variable
	l	EnvKev	string	Required	
	l	EnvValue			Key values of environment variables
	⊢	! !	string	Required	Value value of the environment variable
	Rec	questMemorySize	*int32	Optional	Minimum memory size required by the container to boot for this GPUFunction [Gib]
C	CI.				(Not currently used. The value specified in GPUFunc configuration information is used.)
Spec	Sna	aredMemory	*SharedMemorySpec	Optional	Configuration Information Required to Perform a PCIe Connection over Shared Memory
	l	FilePrefix	string	Required	Information to identify the PCIe connection on the dpdk side
	l	CommandQueueID	string	Required	Identity of the CommandQueue used for data transfer
	l	SharedMemoryMiB	int32	Required	Required size of the shared memory used for data transfer on the PCIe connection [MegaByte]
					(Not currently used. The value is fixed inside the processing module.)
	Pro	tocol	*string	Optional	Receiving communication protocol (required if data is received (source is present))
	٥.,	nfigName			Config name required for Deploy (name of ConfigMap in gpufunc-config-xxx)
	Cor	niigivame	string	Required	(Equivalent to the parent CR WBFunction.spec.ConfigName)
					FunctionCR information for each resource system in the previous section. If there is no previous Function
					wb-start-of-chain), this parameter is not set.
	Pre	viousFunctions	man[string]FromToWBFunction	Optional	key is the same as InputInterface and the input port number (interface identification number) is expressed
				1	a character string.
					(Equivalent to parent WBFunction.spec.PreviousWBFunctions)
		FunctionRef	WBNamespacedName	Required	Resource name and namespace of the corresponding resource function
		Port	int32	Required	Output port number of the other Function connected to the input port number (key value) of the current
	-		IIII.JZ	rvequireu	
					FunctionCR information of various resource systems in the second part. If there is no next Function (= wb- end-of-chain), it is not set.
	Mox	xtFunctions	map[string]FromToWBFunction	Optional	
	ives	xtrunctions	map[string]FromToWBFunction	Uptional	key is the same as OutputInterface, and the output port number (interface identification number) is expres
					as a character string.
		FunctionRef			(Equivalent to parent WBFunction.spec.NextWBFunctions)
			WBNamespacedName	Required	Resource name and namespace of the corresponding resource function
	D.	Port	int32	Required	Input port number of the other Function connected to the output port number (key value) of the current
		rams	map[string]intstr.IntOrString	Optional	Integer/String parameters (Equivalent to the parent CR WBFunction.spec.Params)
		taFlowRef	WBNamespaecedName	Required	Identify original Dataflow (Equivalent to the parent CR WBFunction .status.DataFlowRef)
		nctionName	string	Required	Function name (Equivalent to the parent CR WBFunction.status.FunctionName)
		ageURI	string	Required	Name of the container image of the container to be started by the GPUFunction
	Sha	aredMemory	*SharedMemorySpec	Optional	Shared memory information set for GPUFunction (only when PCIe is connected)
	1	FilePrefix	string	Required	Identity of the CommandQueue used for data transfer
	l	CommandQueueID	string	Required	Information to identify the PCIe connection on the dpdk side
	l	sharedMemoryMiB			Required size of the shared memory used for data transfer on the PCIe connection [MegaByte]
	l	snareaMemoryMiB	int32	Required	(Currently unused.). The value is fixed inside the processing module.)
	RxF	Protocol	*string	Optional	Receiving communication protocol (listed if data is received (source is present))
	TxP	Protocol	*string	Optional	Sender's communication protocol (listed if data is sent (destination is present))
	t-		-	<u> </u>	Config name required for Deploy (name of ConfigMap in gpufunc-config-xxx)
	Cor	nfigName	string	Required	(Equivalent to the parent CR WBFunction.status.ConfigName)
	Virt	tualNetworkDeviceDriverType	string	Optional	CNI Plug-ins for 2nd NICs on Pod
Status		ditionalNetwork	string	Optional	Whether to create a 2nd NICs on Pod
		nctionIndex		_	
		rtTime	int32 metav1.Time	Required Required	Deployed functions on the destination (Equivalent to the parent CR WBFunction.status.RegionName)
	Jtal		mesdV1.Time	required	Creation time
	l		1	1	The state of GPUFunction. Have the following two values
	Star	tus	string	Required	Running: successful creation
	1		,		Pending: Creating
	L		<u> </u>		*Currently I don't use Pending, I just run it after Pod creation is complete.
	IPA	ddress	*string	Optional	IP address (currently unused)
	۵~-	celeratorStatuses		0-1	State of the device that deployed this GPUFunction. It is recorded for each Function (for each container in
	ADD	A. T. I GUID GUIDES	[]AccStatusesByContainer	Optional	case of GPUFunc).
	l	PartitionName	*string	Optional	Information identifying the Function for which status is set
	l	Statuses	[]AccStatuses	Optional	Records status for each Accelerator assigned to GPUFunction
	1	AcceleratorID	*string	Optional	Device UUID
		Status	*string	Optional	Device status. Three types (deployed deploying error) are assumed.

■FPGAFunction custom resource with information about the Function to be deployed on FPGA (modularization) for FJ
Sample processing includes filter and resize for advanced and lightweight inference. Ethernet and PCIe connections are assumed.
Converted from WBFunction and auto-generated

Data Func Node Node Node Node Node Node Node Node	mespace arTowRef artitionName IID gionName IID gionName ArtitionIndex FartitionName EachEaru Emwey Emwey FilePrefix CommandQueueID Shared MemoryMilB shottlonKernelID witernelID meworkKernelID Frotocol	WBNamespacedName string string [JacciDinfo string] string string string JacciDinfo string string "int32 JEnvalnfo string JEnvalnfo string strin	Required Required Required Optional Required Required Required Required Required Required Required Required Required Optional Required Optional	Be set by the user Identify original Dataflow (Equivalent to the parent CR WBFunction spec.DataFlowRef) Name of the Function to execute (Equivalent to the parent CR WBFunction spec.DataFlowRef) Destination of one man (Equivalent to the parent CR WBFunction spec.Davison(mane) Destination Device Type (Equivalent to the parent CR WBFunction spec.Davison(mane) Destination Device Type (Equivalent to the parent CR WBFunction spec.Davisor(Type) The identity of the deployed device (considering the possibility of assigning more than one device to an FPGAFunction in the future) Information (Funkfernelld in the case of FPGAFunction) identifying the Function to which the accelerato to be assigned Accelerator destination to assign to the Function (FPGA device file parts for FPGAFunction) Distinguished name (Equivalent to the parent CR WBFunction spec.RegionName) of the deployment region to which you want to deploy (In the case of FPGAFunction, the FuncChild of the destination circuit) If this parameter is not present, it means that a new deployment is requested. If this parameter is not present, it means that the deataflow should be stored in the circuit or pod correspondit to the already deployed Functions with that FunctionIndex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processin module are specified in the Config Information (figafunc-config-xxx)) Config name required for deploy (name of ConfigMame, which is the parent CR) Configuration Information to Identify the PCIG connection over Shared Memory Information to Identify the PCIG connection of the stransfer on PCIe connections (MegaByte) for total set in the parent CR) Configuration Information (Equivalent to the FPGAFunction) to the specific size of shared memory used for data transfer. Regulared size of shared memory used for data transfer. Regulared size of shared memory used for data transfer.
Data Func Node Node Node Node Node Node Node Node	taFlowRef cotionName deWame viceType eleteratoriDs PartitionName ID gionName iD prititionName EnvironMame EachEru EnvironMame Envi	string string string () AccIDInfo string string string *int32 () Envslinfo string () Envslinfo string () Envslinfo string	Required Required Required Required Required Optional Required Optional Required Optional Required Req	dentify original Dataflow (Equivalent to the parent CR WBFunction spec.DataFlowRef) Name of the Function to execute (Equivalent to the parent CR WBFunction spec.FunctionName) Destination on de mane (Equivalent to the parent CR WBFunction spec.DavionName) Destination Device Type (Equivalent to the parent CR WBFunction spec.DavionFype) The identity of the deployed device (considering the possibility of assigning more than one device to an FPGAFunction in the future) FPGAFunction in the future) The identity of the deployed device (considering the possibility of assigning more than one device to an original device of the parent CR WBFunction spec. RegionName) Consigned and the case of FPGAFunction) (dentifying the Function to which the accelerate to be assigned Accelerator identification to assign to the Function (FPGA device file path for FPGAFunction) Distinguished name (Equivalent to the parent CR WBFunction.spec.RegionName) of the deployment region to which you want to deploy (In the case of FPGAFunction, the FuncChild of the destination circuit) If this parameter is not present, it means that a new deployment is requested. If this parameter is not present, it means that a new deployment is requested. If the parameter is present, it means that the dataflow should be stored in the circuit or pod correspondit to the already deployed functions with that FunctionIndex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processin module are specified in the Config Information (Ingafunc-config-xxx.) Config name required for deploy (name of ConfigMam, which is the parent CR) Configuration functions for against of the data transfer concent over Shared Memory undermation to identify the PCIe connection over the data transfer on PCIe connections (MepBlyte) (not used in the Of the child be moduled was extremed memory used for that transfer on PCIe connections (MepBlyte) (not used in the Of the Child be moduled was extremed memory used for that transfer on PCIe conne
Func Node Deviv Acce Ems Func Confi Func Func Func Func Shara Func Func Func Func Func Func Func Coff Func Func Func Coff Func Func Func Coff Func Func Coff Func Coff Func Func Coff Func Coff Func Coff Func Coff Func Coff Func Func Func Func Coff Func F	victionName deName viceType viceType partitionName ID gionName partitionName EachEnv EachEnv Envisue Envisue Envisue Envisue TipeTritionName EachEnv Envisue	string string string () AccIDInfo string string string *int32 () Envslinfo string () Envslinfo string () Envslinfo string	Required Required Required Required Required Optional Required Optional Required Optional Required Req	Name of the Function to execute (Equivalent to the parent CR WBFunction apec FunctionName) Destination node name (Equivalent to the parent CR WBFunction apec.NodeName) Destination node name (Equivalent to the parent CR WBFunction apec.NodeName) The identity of the deployed device (considering the possibility of assigning more than one device to an FPGAFunction in the future) Information (Funkternelli of the duse of FPGAFunction) identifying the Function to which the accelerate to be assigned Accelerator identification to assign to the Function (FPGA device file path for FPGAFunction) Distinguished name (Equivalent to the parent CR WBFunction, apec.RegionName) of the deployment region to which you want to deploy. Distinguished name (Equivalent to the parent CR WBFunction, apec.RegionName) of the deployment region to the destination (Equivalent to the parent CR WBFunction, apec.RegionName) If this parameter is not present, it means that a new deployment is requested. If this parameter is present, it means that a new deployment is requested to the alternative in parent is requested to the destination (Equivalent to the parent CR WBFunction). This parameter is present, it means that the distallow should be stored in the clicuit or pod correspond to the alternative parent is requested for the parent (Equivalent to WBFunction). The parameter is present, it means that the distallow should be stored in the clicuit or pod correspond to the alternative is present, it means that the distallow should be stored in the clicuit or pod correspond to the alternative is present, it means that the distallow should be stored in the clicuit or pod correspond to the alternative is present, it means that the distallow should be stored in the clicuit or pod correspond to the specified in the Config Information (figafunc-config-xxx). Config mainer required for deploy (name of ConfigMane, which is the parent CR) Config mainer required for deploy (name of ConfigMane, which is the parent CR) Config mainer required for deploy
Devide Acce Regide Funce Envs Confirm Sharar Funce Funce Funce Funce Funce Funce Funce Funce Confirm Sharar Tx Tx Tx Tx Tx Tx Tx	vice I ype PartitionName ID gionName ActionIndex /s PartitionName EachEnv Emvlaue Emvlaue figName figName CommandQueueID SharedMemory FilePerix CommandQueueID SharedMemoryMile actionKernelID MernelID MernelID MernelID Protocol	atring [] Accillinfo atring string string string string string string string linux linux linux linux string str	Required Optional Required Optional Optional Optional Required Optional Required Optional Required Required Required Required Optional Required Optional Optional Optional Optional Optional Optional Optional Optional Optional	Destination Device Type (Equivalent to the parent CR WBFunction.space.DeviceType) The identity of the deployed device (considering the possibility of assigning more than one device to an FPGAFunction in the future) Information (FunkKernellid in the case of FPGAFunction) identifying the Function to which the accelerate to be assigned Accelerator identification to assign to the Function (FPGA device file path for FPGAFunction to be assigned) Accelerator identification to assign to the Function (FPGA device file path for FPGAFunction) Destinguished man (Equivalent to the parent CR WBFunction.space.RegionName) of the deployment region to which you want to deploy 10 the case of FPGAFunction, the FuncCHid of the destination circuit) 11 this parameter is not present, it means that a new deployment is nequested. 11 this parameter is not present, it means that the detaillow should be stored in the circuit or pod corresponds to the already deployed Functions with that FunctionIndex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processing module are specified in the Config Information (figuriun-config-xxx).) Config name required for deploy (name of ConfigMap in figgafunc-config-xxx) (Equivalent to WBFunction spec.ConfigName, which is the parent CR) Configuration findmation fedgraved to Preferra A PEG Connection over Shared Memory Information to identify the PCIe connection on the dpik side Senting or the CommandQueeue used for data transfer and control of the ConfigMap (not used in the Of the child be modules written to the FPGAFunction) to be assigned to this FPGAFunction.
Acce Regix Func Confil Sharn Func Func Func Func Func Confil Sharn Func Func Func Func Confil Sharn Func Func Confil Sharn Func Func Confil Sharn Func Func Confil Sharn Func Confil Sharn Func Confil Sharn Func Func Func Func Func Func Func Func Confil Func Func Func Func Confil Func Func Func Func Confil Func	PartitionName ID gionName ID gionName FPARTITIONName EachEav EnvKey Env	ClaceIDInfo string string string string string string string string string liEnvslato string	Required Required Required Optional Optional Optional Required Optional	The identity of the deployed device (considering the possibility of assigning more than one device to an FPGAFunction in the future) Information (FunkKernelid in the case of FPGAFunction) identifying the Function to which the accelerato to be assigned Accelerator identification to assign to the Function (FPGA device file path for FPGAFunction) Distinguished name (Equivalent to the parent CR WBFunction.psec.RegionName) of the deployment regit to which you want to deploy Deployed functions on the destination (Equivalent to the parent CR WBFunction.spec.RegionName) (in the case of FPGAFunction, the FuncCHId of the destination circuit) If this parameter is not present, it means that a new deployment is requested. If this parameter is not present, it means that the destination circuit) If this parameter is present, it means that the destination of the deployment is requested. If this parameter is not present, it means that the destination circuit or pod correspondit to the already deployed Functions with that FunctionIdes. For setting processing module parameters (not used for FPGAFunction). The parameters of the processin module are specified in the Config Information (figafunc-config-xxx). Config name required for deploy (name of ConfigMane, which is the parent CR) Configuration Information Required to Perform a Pclic Connection over Shared Memory Information to Identify the PClic connection on the dpds side destity of the CommandQueuse used for data transfer Required size of shared memory used for data transfer on PCle connections (MegaByte) (not used in the Off the Child be modules written to the FPGAFunction).
Func Spec Func Fram Rx	PartitionName IID JonName IID JonName PartitionName EachErv EmvKey EmvKey EmvKay EmvAsive EnfigName EardRemory FilePrefix CommandQueueID Shared MemoryMiB actionKernelID MemorkKernelID MemorkKernelID	string	Optional Required Required Optional Required Optional Required Optional Required Optional	FPGAFunction in the future) formation (FunkKernelld in the case of FPGAFunction) identifying the Function to which the accelerate to be assigned and information (FunkKernelld in the case of FPGAFunction) identifying the Function to which the accelerate to be assigned Accelerator identification to assign to the Function (FPGA device file path for FPGAFunction) Distinguished name (Equivalent to the parent CR WBFunction spec.RegionName) of the deployment regit to which you want to deploy or polyped functions the destination (Equivalent to the parent CR WBFunction.spec.RegionName) (in the case of FPGAFunction, the FuncChild of the destination circuit) if this parameter is not present, it means that a new deployment is requested. If this parameter is not present, it means that the detailsow should be stored in the circuit or pod correspondit to the already deployed Functions with that FunctionIndex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processing module are specified in the Config Information (ftpgafunc-config-xxx).) Config name required for deploy (name of ConfigMap in ftpgafunc-config-xxx) Configuration findmation Regulared to Perform a PEIC connection over Shared Memory Information to identify the PCIe connection on the dpik side Senting or the CommandQueeu used for data transfer and connections (MepaByte) (not used in the Of the child be modules written to the FPGAFunction).
Func Spec Func Fram Rx Fram Rx Fram Rx Statat Data Data Func Func Func Func Childida Regis Func Func Func Func Func Func Func Func	pontage of the state of the sta	string	Required Required Optional Optional Required Required Required Required Required Required Required Required Required Optional Required Optional	to be assigned Accelerator identification to assign to the Function (FPGA device file path for FPGAFunction) Distinguished name (Equivalent to the parent CR WiFunction.spec.RegionName) of the deployment regit to which you want to deploy Desployed functions on the destination (Equivalent to the parent CR WiFunction.spec.RegionName) (In the case of FPGAFunction, the FuncChild of the destination circuit) If this parameter is not present, it means that a new deployment is requested. If the parameter is not present, it means that a new deployment is requested. If the parameter is present, it means that the dataflow should be stored in the circuit or pod correspondit to the already deployed Functions with that FunctionIndex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processin module are specified in the Config Information (Ingafunc-config-xxx).) Config name required for deploy (name of ConfigMap in Ingafunc-config-xxx) (Equivalent to WiFunction spec.ConfigName, which is the parent CR) Configuration findmation Required to Perform a PCIE connection over Shared Memory Information to Identify the PCIE connection on the dpits side Sidentity of the Command/Queue used for data transfer Required size of shared memory used for data transfer on PCIE connections (MepBlyte) (not used in the Of the child bis modules written to the FPGAF LID of the Function module whose Function Channel (FuncCH) is to be a saigned to this FPGAFunction.
Regis Func Envs Conff Shan Func Func Func Fram Rx Fram Rx I I I I I Stata Data Data Func Func Func Func Func Func Func Func	jonName jonName partitionIndex /s PartitionName EachEnv EmKey EmKey EmWalue aftgName figName figName foommandQueueID SharedMemoryMiB actionKernelID MiKernelID meworkKernelID protocol	string	Required Optional Required Rouired Required Rouired Required	Accelerator identification to assign to the Function (FPGA device file path for FPGAFunction) Distinguished name (Equivalent to the parent CR WBFunction.psc.RegionName) of the deployment regit to which you want to deploy Deployed functions on the destination (Equivalent to the parent CR WBFunction.spec.RegionName) (in the case of FPGAFunction, the FuncHidl of the destination circuit) If this parameter is not present, it means that a new deployment is requested. If this parameter is present, it means that he dataflow should be stored in the circuit or pod corresponds to the already deployed Functions with that Functioninfex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processin module are specified in the Config Information (figsfunc-config-xxx).) Config name required for deploy (name of ConfigMam, which is the parent CR) Configuration Information Required to Performa PCIE Connection over Shared Memory Information to Identify the PCIE connection on the dopts side Identify of the CommandQueue used for deal transfer Required size of shared memory used for data transfer Required size of shared memory used for data transfer Required size of shared memory used for data transfer Required size of shared memory used for data transfer Required size of shared memory used for data transfer.
Func Envs Confi Sharar Func Func Func Func Func Fam Statat Data Func Func Func Childida	/s PartitionName EachEav Emwlaue Emwlaue fligName fligName Emwlaue fligName fligN	string *int32 Illenvsinfo string UlenvsData string string string string string string *SharedMemorySpec string int32 *int32 *int32	Required Optional Required Rouired Required Rouired Required	Distinguished name (Equivalent to the parent CR WBFunction.spec.RegionName) of the deployment regit to which you want to deploy Deployed functions on the destination (Equivalent to the parent CR WBFunction.spec.RegionName) (In the case of FPGAFunction, the FuncCHid of the destination circuit) If this parameter is not present, it means that a new deployment is requested. If this parameter is present, it means that the dataflow should be stored in the circuit or pod correspondit to the already deployed Functions with that FunctionIndex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processin module are specified in the Config information (figafunc-config-xxx).) Config name required for deploy (name of ConfigMane, which is the parent CR) Configuration formation Required to Parform a PEIG connection over Shared Memory Information to Identify the PCID connection over the option side destingtion of the Configuration the Configuration of the Configuration o
Func Envs Confi Sharar Func Func Func Func Func Fam Statat Data Func Func Func Childida	/s PartitionName EachEav Emwlaue Emwlaue fligName fligName Emwlaue fligName fligN	"int32 DEnvisinfo string (HerwiData string string string string string "SharedMemorySpec string int32 "int32	Optional Required	Deployed functions on the destination (Equivalent to the parent CR WEFunction.spec.RegionName) (In the case of FPGAFunction, the FuncCHId of the destination circuit) If this parameter is not present, it means that a new deployment is requested. If this parameter is present, it means that the dataflow should be stored in the circuit or pod correspondit to the already deployed Functions with that FunctionIdes. For setting processing module parameters (not used for FPGAFunction). The parameters of the processin module are specified in the Config information (fipgafunc-config-xxx).) Config name required for deploy (name of ConfigMap in fipgafunc-config-xxx) (Equivalent to WEFunction.spec.ConfigMame, which is the parent CR) Configuration foreignation Required to Performa Polic Connection over Shared Memory Information to Identify the PCID connection over the option side dentity of the CommandQueue used for data transfer Required size of shared memory used for data transfer on PCIe connections (MegaByte) (not used in the Of the child be modules written to the FPGAFunction).
Envs. Confile Time Time Time Time Time Time Time Tim	PartitionName EachEnv EmvKey EmvValue ntipName EmvValue ntipName FilePrefix CommandQueuelD SharedMemoryMilB actionKernelID MemoryKernelID MemoryKernelID Protocol	[] Envisinfo string [] Envising string strin	Optional Required Required Required Required Required Required Required Optional Required Required Optional	(in the case of FPGAFunction, the FuncCHId of the destination circuit) If this parameter is not present, it means that a now deployment is requested. If this parameter is present, it means that the destation should be stored in the circuit or pod corresponds to the already deployed Functions with that FunctionIndex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processing module are specified in the Config Information (flogsfunc-config-xox).)
Envs. Confile Time Time Time Time Time Time Time Tim	PartitionName EachEnv EmvKey EmvValue ntipName EmvValue ntipName FilePrefix CommandQueuelD SharedMemoryMilB actionKernelID MemoryKernelID MemoryKernelID Protocol	[] Envisinfo string [] Envising string strin	Optional Required Required Required Required Required Required Required Optional Required Required Optional	If this parameter is not present, it means that a new deployment is requested. If this parameter is present, it means that he dataflow should be stored in the circuit or pod corresponds to the already deployed Functions with that Functioninfex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processin module are specified in the Config Information (figafunc-config-xxx).) Config name required for deploy (name of ConfigMap in figafunc-config-xxx) (Equivalent to WBFunction .psec.ConfigMame, which is the parent CR) Configuration Information Required to Perform a PCIE Connection over Shared Memory Information to Identify the PCIE connection over the dpdk side Identify of the Connection over the data transfer Required size of shared memory used for data transfer Required size of shared memory used for data transfer Required size of shared memory used for data transfer.
Confil T	PartitionName EachEnv EnvKey EnvValue nfigName envolume nfigName StandMemory FilePrefix CommandQueueliD SharedMemoryMilB actionKernelID MemoryKernelID Protocol	atring IJEnvsData string	Required Required Required Required Required Optional Required Required Required Optional	to the already deployed Functions with that FunctionIndex. For setting processing module parameters (not used for FPGAFunction). The parameters of the processing module are specified in the Config information (ftgafunc-config-xxx). Config name required for deploy (name of ConfigMap in ftgafunc-config-xxx) (Equivalent to WBFunction spec.ConfigMane, which is the parent CR) Configmation formation Required for Perform a PEIC connection over Shared Memory Information to Identify the PCIP connection over Shared Memory Information to Identify the PCIP connection over the golds side Identify of the Connection over the golds side Identify of the Connection over Shared Memory used for data transfer Required size of shared memory used for data transfer Required size of shared memory used for data transfer.
Confil T	PartitionName EachEnv EnvKey EnvValue nfigName envolume nfigName StandMemory FilePrefix CommandQueueliD SharedMemoryMilB actionKernelID MemoryKernelID Protocol	atring IJEnvsData string	Required Required Required Required Required Optional Required Required Optional Required Optional Required Optional	For setting processing module parameters (not used for FPGAFunction). The parameters of the processin due to the specified in the Config Information (figarfunc-config-xxx).) Config name required for deploy (name of ConfigMap in figarfunc-config-xxx) (Equivalent to WBFunction spec.ConfigMame, which is the parent CR) Configuration findmation Required to Perform a PCIE Connection over Shared Memory Information to Identify the PCIE connection over the optimized of the CommandQueue used for data transfer Required size of shared memory used for data transfer on PCIE connection over Shared Memory and the CommandQueue used for data transfer OFCIE connection (MegaByte) (not used in the Of the child bis modules written to the FPGAF.
Confil T	PartitionName EachEnv EnvKey EnvValue nfigName envolume nfigName StandMemory FilePrefix CommandQueueliD SharedMemoryMilB actionKernelID MemoryKernelID Protocol	atring IJEnvsData string	Required Required Required Required Required Optional Required Required Optional Required Optional Required Optional	module are specified in the Config information (fpgafunc-config-xxx).) Config name required for deploy (name of ConfigMap in fpgafunc-config-xxx) (Equivalent to WBFunction apec.ConfigName, which is the parent CR) Configuration information Required to Perform a PCIE connection over Shared Memory Information to Identify the PCIE connection on the dopts side (Identity of the CommandQuieue used for data transfer Required size of shared memory used for data transfer Required to the Connection of the Connectio
Spec Func Func Func Func Shara Func Func Child Continue Con	EachEnv EmvKey EmvValue IntigName aredMemory FileIPerfix CommandQueueID SharedMemoryMilB actionKernelID actionChannelID meworkKernelID Protocol	(] Envisors a string st	Required Required Required Required Optional Required Required Optional Required Optional Required Required Required	If Equivalent to WBFunction spec-ConfigName, which is the parent CR) Configuration Information Required to Perform a PCIE Connection over Shared Memory information to Identify the PCIE connection over the dpdk side identity of the CommandQueue used for data transfer Required size of shared memory used for data transfer on PCIE connections (MegaByte) (not used in the Of the child bis modules written to the PFDA: 10 of the Function module whose FunctionChannel (FuncCH) is to be assigned to this PFDAFunction.
Confi Shana Tan Tan Tan Tan Tan Tan Tan Tan Tan	EnvKey EnvValue rfigName rrigName rrigN	string string string string "SharedMemorySpec string string int32 "int32 "int32	Required Required Required Optional Required Required Required Optional	If Equivalent to WBFunction spec-ConfigName, which is the parent CR) Configuration Information Required to Perform a PCIE Connection over Shared Memory information to Identify the PCIE connection over the dpdk side identity of the CommandQueue used for data transfer Required size of shared memory used for data transfer on PCIE connections (MegaByte) (not used in the Of the child bis modules written to the PFDA: 10 of the Function module whose FunctionChannel (FuncCH) is to be assigned to this PFDAFunction.
Shanning Sha	nfigName sredMemory FilePrefix CommandQueueID SharedMemoryMiB sctionKerneIID MemoryMiB MemoryMiB sctionChanneIID	string "SharedMemorySpec string string int32 "int32 "int32	Required Optional Required Required Required Optional	If Equivalent to WBFunction spec-ConfigName, which is the parent CR) Configuration Information Required to Perform a PCIE Connection over Shared Memory information to Identify the PCIE connection over the dpdk side identity of the CommandQueue used for data transfer Required size of shared memory used for data transfer on PCIE connections (MegaByte) (not used in the Of the child bis modules written to the PFDA: 10 of the Function module whose FunctionChannel (FuncCH) is to be assigned to this PFDAFunction.
Shanning Sha	aredMemory FilePrefix CommandQueueID SharedMemoryMiB ActionKerneIID ActionChanneIID	*SharedMemorySpec string string lin32 *int32	Optional Required Required Required Optional	If Equivalent to WBFunction spec-ConfigName, which is the parent CR) Configuration Information Required to Perform a PCIE Connection over Shared Memory information to Identify the PCIE connection over the dpdk side identity of the CommandQueue used for data transfer Required size of shared memory used for data transfer on PCIE connections (MegaByte) (not used in the Of the child bis modules written to the PFDA: 10 of the Function module whose FunctionChannel (FuncCH) is to be assigned to this PFDAFunction.
Spec Func Func Func Fram Rx Fram Rx Tx Tx Tx Fram Stata Data Func Func Func Func Func Func Func Func	FilePrefix CommandQueueID SharedMemoryMiB StaredMemoryMiB sctionKerneIID sctionChanneIID skerneIID protocol	string string int32 *int32 *int32	Required Required Required Optional	Configuration Information Required to Perform a PCIE Connection over Shared Memory information to identify the PCIe connection on the dpdk side identity of the CommandQueue used for data transfer Required size of shared memory used for data transfer on PCIe connections [MegaByte] (not used in the Of the child be modules written to the FPGA: ID of the Function module whose FunctionChannel (FuncCH) is to be assigned to this FPGAFunction.
Spec Func Func Func Fram Rx Fram Rx Tx Tx Tx Fram Stata Data Func Func Func Func Func Func Func Func	FilePrefix CommandQueueID SharedMemoryMiB StaredMemoryMiB sctionKerneIID sctionChanneIID skerneIID protocol	string string int32 *int32 *int32	Required Required Required Optional	Information to Identify the PCIIc connection on the globs side Identify of the CommanQueue used for data transfer Required size of shared memory used for data transfer on PCIe connections [MegaByte] (not used in the Of the child be modules written to the FPGA: ID of the Function module whose FunctionChannel (FuncCH) is to be a saligned to this FPGAFunction.
Spec Func Func Func Fram Rx Fram Rx I I I I I I I I I I I I I I I I I I	Shared MemoryMiB ctionKarnelID ctionChannelID ctionChannelID meworkKernelID Protocol	int32 *int32 *int32	Required	Required size of shared memory used for data transfer on PCIe connections [MegaByte] (not used in the Of the child bs modules written to the FPGA: ID of the Function module whose FunctionChannel (FuncCH) is to be assigned to this FPGAFunction.
Func Func Func Func Func Statu	nctionKernellD nctionChannellD iKernellD imeworkKernellD	*int32 *int32	Optional	Of the child bs modules written to the FPGA: ID of the Function module whose FunctionChannel (FuncCH) is to be assigned to this FPGAFunction.
Func PtuKur Fram Rx I I I I Statu Data Func Func Pare Childida	nctionChannelID #KernelID meworkKernelID Protocol	*Int32		ID of the Function module whose FunctionChannel (FuncCH) is to be assigned to this FPGAFunction.
PtuK Fram Rx Fram Rx Fx	iKernellD imeworkKernellD Protocol		Optional	tree e a company and a company
PtuK Fram Rx Fram Rx Fx	iKernellD imeworkKernellD Protocol		Optional	(The Function module is the module in the child be that is responsible for executing the processing modul.) ID of the FuncCH applicant to EPCAF unation.
PtuK Fram Rx Fram Rx Fx	iKernellD imeworkKernellD Protocol		Optional	ID of the FuncCH assigned to FPGAFunction (FunCH is a virtual resource allocated to each DataFlow (FPGAFunc) in order to share an FPGA circuit w
Fram Rx I I I I I I I I I I I I I I I I I I	meworkKernellD Protocol	*int32		multiple FPGAFunc.).
Fram Rx I I I I I I I I I I I I I I I I I I	meworkKernellD Protocol	*int32		managed by the Function module)
Rx	Protocol		Optional	Of child bs modules written to the FPGA: ID of the PTU module to be used by FPGAFunction
Rx	Protocol			(The Ptu module is a module in the child bs that is the NW termination of Ethernet communication)
Tx Tx Statu Data Func Func Func Childida		*int32 RxTxData	Optional Optional	Chain Control Module ID(Modules.Chain.ID equivalent of ChildBs)
Tx Tx Ti		string	Required	Receiving network information to be assigned to FPGAFunction Receiving communication protocol
Tx Tx F I I I I I I I I I I I I	IPAddress	*string	Optional	Receiving IP address (for Ethernet connections. Not required for PCIe connections)
Tx Tx Ti Ti Ti Ti Ti Ti Ti Ti	Port	*int32	Optional	Receiving port number (for Ethernet connection. Not required for PCle connections)
Tx Tx F G C C C C C C C C C C C C	SubnetAddress GatewayAddress	*string *string	Optional	Receiving subnet address (for Ethernet connections. Not required for PCle connections) Receiving gateway address (for Ethernet connections. Not required for PCle connections)
Tx Tx Tx Ti Ti Ti Ti Statu Data Func Func Func Child	DMAChannelID	*int32	Optional	The ID of the receiving DMA channel (required for PCle connections). Not required for Ethernet
Statu Data Func Pare Child	LLDMAConnectorID	*int32	Optional	The connector ID of the receiving LLDMA for DMA transfer (required for PCIe connection). Not required
Statu Data Func Func Pare Child	1	RxTxData	Optional	Ethernet connections) Sender network information to be assigned to FPGAFunction
Statu Data Func Func Pare Child	Protocol	string	Required	sender's communication protocol
Statu Data Func Func Pare Child	IPAddress Port	*string *int32	Optional Optional	Sender IP address (for Ethernet connections. Not required for PCle connections)
Statu Data Func Func Pare Child	SubnetAddress	*string	Optional	Transmitting port number (for Ethernet connection. Not required for PCIe connections) The sender's subnet address (for Ethernet connections. Not required for PCIe connections)
Data Func Func Pare Child	GatewayAddress	*string	Optional	The gateway address of the sender (for Ethernet connections. Not required for PCIe connections)
Data Func Func Pare Child	DMAChannelID	*int32	Optional	The ID of the sending DMA channel (required for PCle connections). Not required for Ethernet connection
Data Func Func Pare Child	LLDMAConnectorID	*int32	Optional	The connector ID of the sending LLDMA for DMA transfer (required for PCIe connection). Not required for Ethernet connections)
Data Func Func Pare Child				The state of FPGAFunction. Have the following two values
Func Func Pare Child	itus	string	Requried	Running: successful creation Pending: Creating
Func Func Pare Child				*I don't use Pending at the moment, I set it to Running after FPGAFunction creation process.
Func Pare Child	taFlowRef	WBNamespaecedName	Required	Identify original Dataflow (Equivalent to the parent CR WBFunction.status.DataFlowRef)
Pare	nctionName	string	Required	Function name (Equivalent to WBFunction .status.FunctionName which will be the parent CR)
Child	nctionIndex	int32	Optional	Deployed functions on the destination (Equivalent to the parent CR WBFunction.status.RegionName)
	rentBitstreamName IdBitstreamName	string	Required	Parent bitstream name (Filename of the .mcs file) written to FPGAFunction destination Child bit stream name (Filename of the bit file) written in the deployment destination of the EPGAFunction
Shan	aredMemory	string *SharedMemorySpec	Required Optional	Child bit stream name (Filename of the bit file) written in the deployment destination of the FPGAFunction Shared memory information set for FPGAFunction (only when PCIe is connected)
F	FilePrefix	string	Required	Information to identify the PCIe connection on the dpdk side
	CommandQueueID sharedMemoryMiB	string int32	Required	Identity of the CommandQueue used for data transfer
	sharedMemoryMiB nctionKernelID	int32 int32	Required Requried	Required size of shared memory used for data transfer on PCIe connections [MegaByte] (not used in the ID of the Function module that has the FunctionChannellD (FuncCHId) to be assigned to this FPGAFunct
Func	nctionChannelID	int32	Requried	ID of the FuncCH assigned to FPGAFunction
	iKernellD imeworkKernellD	int32 int32	Required	ID of the PTU module to be used by FPGAFunction Chair Control Module ID(Modules Chair ID continuent of ChildRe)
Rx		RxTxData		Chain Control Module ID(Modules.Chain.ID equivalent of ChildBs) Receiving network information assigned to FPGAFunction
	Protocol	string	Required	Receiving communication protocol
	IPAddress D	*string	Optional	Receiving IP address (for Ethernet connections. Not required for PCIe connections)
	Port SubnetAddress	*int32 *string	Optional Optional	Receiving port number (for Ethernet connection. Not required for PCle connections) Receiving subnet address (for Ethernet connections. Not required for PCle connections)
	GatewayAddress	*string	Optional	Receiving gateway address (for Ethernet connections. Not required for PCIe connections)
		*int32	Optional	The ID of the receiving DMA channel (required for PCle connections). Not required for Ethernet
L	DMAChannelID	*int32	Optional	The connector ID of the receiving LLDMA for DMA transfer (required for PCle connection). Not required Ethernet connections)
Tx	DMAChannelID LLDMAConnectorID	RxTxData	Required	Sender's network information assigned to FPGAFunction
		string	Required	sender's communication protocol
	LLDMAConnectorID Protocol	*string *int32	Optional	Sender IP address (for Ethernet connections. Not required for PCle connections) Transmitting port number (for Ethernet connection. Not required for PCle connections)
	LLDMAConnectorID Protocol IPAddress		Optional	Transmitting port number (for Etnemet connection, Not required for PCIe connections) The sender's subnet address (for Ethernet connections, Not required for PCIe connections)
	LLDMAConnectorID Protocol	*string	Optional	The gateway address of the sender (for Ethernet connections. Not required for PCIe connections)
	Protocol IPAddress Port SubnetAddress GatewayAddress	*string *string	Optional	The ID of the sending DMA channel (required for PCle connections). Not required for Ethernet connectic
ļ.	Protocol IPAddress Port SubnetAddress	*string	Optional	The connector ID of the sending LLDMA for DMA transfer (required for PCIe connection). Not required f Ethernet connections)
Ac	Protocol IPAddress Port SubnetAddress GatewayAddress	*string *string		State of the device that deployed this FPGAFunction.
	Protocol IPAddress Port SubnetAddress GatewayAddress DMAChannelID LLDMAConnectorID	*string *string *int32 *int32	Onti	
	Protocol IPAddress Port SubnetAddress GatewayAddress DMAChannelID LLDMAConnectorID	*string *string *int32 *int32 []AccStatusesByDevice	Optional	Each Function (or FuncCHId in the case of FPGAFunc).
	Protocol IPAddress Port SubnetAddress GatewayAddress DMAChannelID LLDMAConnectorID	*string *string *int32 *int32	Optional Optional	

So custom resource with information about the child bitstream (child bs) writing to the FPGA using a .bit file

It has all the information written in this child bs (including the parameters set for each module).

It also has all the resources in the FPGA after writing child bs.

Also has resource capacity information after child bs is written

Automatically generated by FPGAFunction controller when a child bs write is required upon receipt of a FPGAFunction deployment request

	Nam	0				Tunn	Reg/Opt	Description
	Nam	ie				-	-	Be set by the user
	Nam	espa	ce			-		Be set by the user
	OwnerRefere		eferences		-	-	Reference information for the k8s resource associated with the ChildBs. This contains information about FPGA resource that is the parent CR.	
metadata	l p	APIVe	ersion					API version of the FPGA resource that is the parent CR
	I L	Kind				-	-	"FPGA" fixed because it is the Kind of FPGA resource that is the parent CR
		Name Uid	1			-		Name of the FPGA resource that is the parent CR
						-	-	UUID of the FPGA resource that is the parent CR A list of each region present on the ChildBs. It has information of each region as a list.
	Regio	ons				Required	[]ChildBsRegion	(Currently, each lane corresponds to each region.)
		Modu	Ptu Ptu			Optional	*ChildBsModule	A group of FPGA modules constituting the region. Contains information about the following modules, if a
		P				Optional	*ChildBsPtu	Information of the PTU module responsible for Ethernet communication to be written for the region Connection ID available to PTU modules under this region ("random" indicates that the value is determined.
			Cic	s		Optional	*string	during operation)
			ID			Optional	*int32	ID of the PTU module under this region
			Pai	ameter		Optional	*map[string]intstr.IntOrString	(Currently the same as the region ID (– Lane number). 1 PTU module per lane) Parameters to set for the PTU module. A map where key is the parameter name and value is the value.
		L	LDMA	umotor		Optional	*ChildBsLLDMA	Information of the LLDMA module responsible for DMA communication to be written for the region
			Cic	s		Optional	*string	Connection ID that can be taken by the LLDMA module under this region
			ID			Optional	*int32	ID of the LLDMA module under the region
		-						(Currently the same as the region ID (– Lane number). One LLDMA module per lane is assumed) Information of the Chain module, which is responsible for associating I/O and Function modules, to be
		C	hain			Optional	*ChildBsChain	written for this region
			ID			Optional	*int32	ID of the Chain module under the region
			Ide	ntifier		Optional	*string	(Currently the same as the region ID (— Lane number). One Chain module per lane is assumed) Module identifier of the Chain module (with an identifier determined for each module type)
			Ту			Optional	*string	String representing the module type of the Chain module
				rsion		Optional	*string	The version of the Chain module (ChildBs implementation time).
		D				Optional	*ChildBsDirecttrans	Information of the Directtrans module responsible for direct transfer written under the region ID of the Directtrans module under this region
			ID			Optional	*int32	(Currently the same as the region ID (= Lane number). One Directtrans module per lane is assumed)
				dentifier ype ersion		Optional	*string	Module identifier of the Directtrans module
						Optional	*string	A string that indicates the module type of the Directtrans module.
		C	Ver			Optional Optional	*string *ChildBsConversion	Directtrans module version (ChildBs implementation time) Information of the Conversion module responsible for the conversion process to be written for the region
		ľ	ID	-				ID of the Conversion module under this region
			_)		Optional	*int32	(Currently the same as the region ID (= Lane number). One Conversion module per lane is assumed)
			Mo	dule Identif		Optional Optional	*[]ConversionModule	List of modules that the Conversion module writing for this region can take
				Type	ei	Optional	*string *string	Module identifier of the Conversion module String representing the module type of the Conversion module
				Versio	1	Optional	*string	Conversion Module version (ChildBs implementation time)
		F	unctio	ns		Optional	*[]ChildBsFunctions	A list containing information about each Function module responsible for executing the processing modul
			г			ļ ·	-	to be written for this region. ID of the Function module under this region
			ID			Optional	*int32	(For filter/resize FPGAs, this is the same as the region ID (= Lane number). One Function module per lar is assumed)
			Mo	dule		Optional	*[]FunctionsModule	List of Function modules to be written for this region
				Functi	onChannelIDs	Optional	*string	Function channel ID that the function module can take
Spec				Identif	er	Optional	*string	Module identifier of the Function module for the processing module (The module identifier of a Function module differs depending on the type of processing module.)
				Туре		Optional	*string	Character string indicating the module type of the Function module for the processing module
			L	Versio		Optional	*string	Function module version for the processing module (ChildBs implementation time)
			Pai	ameter	i	Optional	*map[string]intstr.IntOrString	Parameters set for the Function module. A map where key is the parameter name and value is the value. Resource information in the FPGA managed by the Function module
			Inti	aResou	rceMgmtMap	Optional	*map[string] FunctionsIntraResourceMgmtMap	where key is FunctionChannellD (FuncCHID) and value is a map of the resources in the FPGA to be prepared for that FuncCHID. (For each FuncCHID, the resource in the FPGA to be paid to the FPGAFunc is determined in combination with its Id.)
				Availal	le	Optional	*bool	Whether the FuncCHID entry is available. (false if used, true if unused (= usable))
				F	CDN	0		Information of CR, FPGAFunction to which the FuncCHID is assigned
				Functi	onCRName	Optional	*string	(Initially, nil. If FuncCHID is assigned to FPGAFunction, provide information about that FPGAFunction.)
				Rx		Optional	*RxTxSpec	Receiving side network information to be allocated to FPGAFunction in set with the FuncCHID
				Pr	otocol	Optional	*map[string]Details	Details of the network information to give as the receiver. A map where key is the protocol name and values the detail information.
					Port	Ontional	*int32	Port number to be given as the receiver
					TOIL	Ориона	III.32	(For Ethernet connections (protocol is TCP/RTP). PCle connection (not required for DMA protocol)
					DMAChannelID	Optional	*int32	ID of the DMA channel to be given as the receiver (For PCIe connections (protocol is DMA). Ethernet connection (not required for TCP/RTP protocol)
					11 DMAC1D			ID of the connector for DMA transfer on the LLDMA side to be given as the receiver
				Ш	LLDMAConnectorID	Optional	*int32	(For PCIe connections (protocol is DMA). Ethernet connection (not required for TCP/RTP protocol)
				Tx		Optional	*RxTxSpec	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID
				Pr	otocol	Optional	*map[string]Details	Details of network information to give as sender. A map where key is the protocol name and value is the detail information.
					Port	Optional	*int32	Port number to be given as the sender
						Optional	nno£	(For Ethernet connections (protocol is TCP/RTP). PCle connection (not required for DMA protocol)
					DMAChannelID	Optional	*int32	ID of the DMA channel to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not required for TCP/RTP protocol)
					LLDMAConnectorID	0-1:	*:-120	Connector Id for DMA transfer on LLDMA side to be given as sender
			L			Optional	*int32	(For PCle connections (protocol is DMA). Ethernet connection (not required for TCP/RTP protocol)
			De	oloySpe		Required	FunctionsDeploySpec	Resource capacity information of the processing module written in the function module The maximum processing power (first of the deployed Function of the processing module, it depends on
				MaxCa	pacity	Optional	*int32	The maximum processing power (fps) of the deployed Function of the processing module. It depends on circuit implementation.
				MaxD:	taFlows	Optional	*int32	Maximum number of DFs installed in the processing module (number of WBFunctions). It depends on the
						opaonal		number of channels of the circuit, etc.
		MaxF	unctio	ns		Optional	*int32	Maximum number of processing modules (Functions) that can be written in this region (Number of Functions = Number of circuits)
		MaxC	apacit	у		Optional	*int32	Maximum processing power (fps) for the entire region
	1 5	Name				Optional	*string	Domain name of the domain (currently Lane number)
						Optional		ID of the Bitstream from which the ChildBs resource is based (Bitstream ID to be written in .bit file) A list of each region present on the ChildBs. Have a list of information for each region
	Child			Regions Required []ChildBsRegion				(Currently, each lane corresponds to each region.)
	Child						*ChildBsModule	A group of FPGA modules constituting the region. Contains information about the following modules, if a
	Child	ons Modu	les			Optional		
	Child	ons Modu				Optional Optional	*ChildBsPtu	Information of the PTU module responsible for Ethernet communication written in the region
	Child	ons Modu	les	s			*ChildBsPtu *string	Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region
	Child	ons Modu	les tu Cid	s		Optional Optional	*string	Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region ("random" indicates that the value is determined at runtime)
	Child	ons Modu	les 'tu Cid			Optional		Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region
	Child	ons Modu P	les tu Cid	ameter		Optional Optional Optional Optional	*string *int32 *map[string]intstr.IntOrString	Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region ('random' indicates that the value is determined at runtime) ID of the PTU module under this region Currently the same as the region ID (- Lane number). 1 PTU module per lane) Parameters to set for the PTU module. A map where key is the parameter name and value is the value.
	Child	ons Modu P	les tu Cid ID Pai	ameter		Optional Optional Optional Optional Optional	*string *int32 *map[string]intstr.IntOrString *ChildBsLLDMA	Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region ("random" indicates that the value is determined at runtime) ID of the PTU module under this region (Currently the same as the region ID (= Lane number), 1 PTU module per lane) Parameters to set for the PTU module. A map where key is the parameter name and value is the value. Information of the LLDMA module responsible for DMA communication written in the region
	Child	ons Modu P	les Cic ID Pai	ameter		Optional Optional Optional Optional Optional Optional Optional	*string *int32 *map(string)intstr.IntOrString *ChildBsLLDMA *string	Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region ("random" indicates that the value is determined at runtime) ID of the PTU module under this region (Currently the same as the region ID (— Lane number). 1 PTU module per lane) Parameters to set for the PTU module. A map where key is the parameter name and value is the value. Information of the LLDMA module responsible for DMA communication written in the region Connection ID that can be taken by the LLDMA module under this region
	Child	ons Modu P	les tu Cid ID Pai	ameter		Optional Optional Optional Optional Optional	*string *int32 *map[string]intstr.IntOrString *ChildBsLLDMA	Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region ("random" indicates that the value is determined at runtime) ID of the PTU module under this region (Currently the same as the region ID (= Lane number), 1 PTU module per lane) Parameters to set for the PTU module. A map where key is the parameter name and value is the value. Information of the LLDMA module responsible for DMA communication written in the region
	Child	ons Modu P	les Cic ID Pai	ameter		Optional Optional Optional Optional Optional Optional Optional Optional	*string *int32 *map[string]intstr.IntOrString *ChildBst.LDMA *string *int32	Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region ("random" indicates that the value is determined at runtime) ID of the PTU module under this region (Currently the same as the region ID (— Lane number). I PTU module per lane) Parameters to set for the PTU module. A map where key is the parameter name and value is the value. Information of the LLDMA module responsible for DMA communication written in the region Connection ID that can be taken by the LLDMA module under this region ID of the LLDMA module under the region Currently the same as the region ID (— Lane number). One LLDMA module per lane is assumed) Information of the Chain module, which is responsible for associating I/O and Function modules, written
	Child	ons Modu P	ID Pail	ameter		Optional Optional Optional Optional Optional Optional Optional	*string *int32 *map(string)intstr.IntOrString *ChildBsLLDMA *string	Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region ('random' indicates that the value is determined at runtime) ID of the PTU module under this region (Currently the same as the region ID (- Lane number), I PTU module per lane) Parameters to set for the PTU module. A map where key is the parameter name and value is the value. Information of the LLDMA module responsible for DMA communication written in the region Connection ID that can be taken by the LLDMA module under this region ID of the LLDMA module under the region (Currently the same as the region ID (- Lane number). One LLDMA module per lane is assumed) Information of the Chain module, which is responsible for associating I/O and Function modules, written this region
	Child	ons Modu P	Ies Ttu Cid ID Pai	ameter		Optional Optional Optional Optional Optional Optional Optional Optional	*string *int32 *map[string]intstr.IntOrString *ChildBst.LDMA *string *int32	Information of the PTU module responsible for Ethernet communication written in the region Connection ID that can be taken by the PTU module under this region ("random" indicates that the value is determined at runtime) ID of the PTU module under this region (Currently the same as the region ID (- Lane number). 1 PTU module per lane) Parameters to set for the PTU module. A map where key is the parameter name and value is the value. Information of the LLDMA module responsible for DMA communication written in the region Connection ID that can be taken by the LLDMA module under this region ID of the LLDMA module under the region Currently the same as the region ID (- Lane number). One LLDMA module per lane is assumed) Information of the Chain module, which is responsible for associating I/O and Function modules, written

			ype		Optional	*string	String representing the module type of the Chain module
		Direct	ersion		Optional	*string *ChildBsDirecttrans	The version of the Chain module (ChildBs implementation time).
							Information of the Directtrans module that is responsible for direct transfer under the region written in the ID of the Directtrans module under this region
		IC)		Optional	*int32	(Currently the same as the region ID (= Lane number). One Directtrans module per lane is assumed)
		ld	dentifier		Optional	*string	Module identifier of the Directtrans module
			ype		Optional	*string	A string that indicates the module type of the Directtrans module.
			ersion		Optional	*string	Directtrans module version (ChildBs implementation time)
		Conve			Optional	*ChildBsConversion	Information of the Conversion module responsible for conversion processing written in the region
		IC)		Optional	*int32	ID of the Conversion module under this region (Currently the same as the region ID (= Lane number). One Conversion module per lane is assumed)
		M	lodule		Optional	*[]ConversionModule	List of modules that Conversion modules under this region can take
			Identif	ier	Optional	*string	Module identifier of the Conversion module
			Type		Optional	*string	String representing the module type of the Conversion module
			Version	1	Optional	*string	Conversion Module version (ChildBs implementation time)
		Functi	ions		Optional	*[]ChildBsFunctions	A list containing information about each Function module that is responsible for executing the processing
							module written in the region. ID of the Function module under the region (same as the region ID (= Lane number) for filter/resize
		IC	ID			*int32	FPGAs). One Function module per lane is assumed)
		M	lodule		Optional	*[]FunctionsModule	List of Function modules written in this region
			Function	onChannelIDs	Optional	*string	Function channel ID that the function module can take
			Identif	ier	Optional	*string	Module identifier of the Function module for the processing module
							(The module identifier of a Function module differs depending on the type of processing module.)
			Type	2	Optional	*string *string	Character string indicating the module type of the Function module for the processing module
		Pi	'arameters		Optional	*map[string]intstr.IntOrString	Function module version for the processing module (ChildBs implementation time) Parameters set for the Function module. A map where key is the parameter name and value is the value.
		ΙĒ			Optional	mappamgimaamaaaa	Resource information in the FPGA managed by the function module.
							where key is FunctionChannelID (FuncCHID) and value is a map of the resources in the FPGA to be
Status		In	ntraResou	rceMgmtMap	Optional	*map[string] FunctionsIntraResourceMgmtMap	prepared for that FuncCHID.
						runctionsintrakesourcewigmtiwap	(For each FuncCHID, the resource in the FPGA to be paid to the FPGAFunc is determined in combination
							with its ld.)
			Available		Optional		Whether the FuncCHID entry is available.
							(false if used. true if unused (= usable)) Information of CR of FPGAFunction to which the entry was given
			FunctionCRName		Optional		(Initially, nil. If a FuncCHID is assigned to an FPGAFunc, enter the information of that FPGAFunc.)
			Rx		Optional	*RxTxSpec	Receiving side network information to be allocated to FPGAFunction in set with the FuncCHID
			Pr	otocol	Optional	*map[string]Details	Details of the network information to give as the receiver. A map where key is the protocol name and value
					Optional	mappamgjocana	is the detail information.
				Port	Optional	*int32	Port number to be given as the receiver
							(For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the receiver
				DMAChannelID	Optional	*int32	(For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol)
							Connector Id for DMA transfer on LLDMA side to be given as receiver
				LL DMAConnoctorID		*int32	
				LLDMAConnectorID	Optional		(For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol)
			Tx	LLDMAConnectorID	Optional	*RxTxSpec	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID
				LLDMAConnectorID otocol		*RxTxSpec *map[string]Details	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the
					Optional		Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information.
					Optional		Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information. Details of network information. Port number to be given as the sender
				otocol	Optional Optional Optional	*map[string]Details *int32	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DMA protocol)
				otocol	Optional Optional	*map[string]Details	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information. Details of network information. Port number to be given as the sender
				Port DMAChannelID	Optional Optional Optional Optional	*map[string]Details *int32 *int32	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connection of DMA transfer on the LLDMA side to be given as the sender
			Pr	Port DMAChannelID LLDMAConnectorID	Optional Optional Optional Optional Optional	*map[string]Details *int32 *int32 *int32	Transmitter's network information to be allocated to the FPGAF unction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connector for DMA transfer on the LLDMA side to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol)
		D		Port DMAChannelID LLDMAConnectorID	Optional Optional Optional Optional	*map[string]Details *int32 *int32	Transmitter's network information to be allocated to the FPGAF unction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DMA protocol) Do f the DMA channel to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connector for DMA transfer on the LLDMA side to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module
		D	Pr	Port DMAChannelID LLDMAConnectorID	Optional Optional Optional Optional Optional	*map[string]Details *int32 *int32 *int32	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connection for DMA transfer on the LLDMA side to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fos) of the deployed Function of the processing module. It depends on the
		D	Pr PeploySpei MaxCa	Port DMAChannellD LLDMAConnectorID	Optional Optional Optional Optional Optional Optional Optional	*map[string]Details *int32 *int32 *int32 *int32 FunctionsDeploySpec *int32	Transmitter's network information to be allocated to the FPGAF unction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connector for DMA transfer on the LLDMA side to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation.
		D	Pr PeploySpei MaxCa	Port DMAChannelID LLDMAConnectorID	Optional Optional Optional Optional Optional Required	*map[string]Details *int32 *int32 *int32 *int32 FunctionsDeploySpec	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DIMA protocol) ID of the DMA channel to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connector for DMA transfer on the LLDMA side to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation.
	Ma		Pr PeploySpee MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional Optional Optional Optional Optional Optional Required Optional	*map[string]Details *int32 *int32 *int32 *int32 FunctionsDeploySpec *int32 *int32	Transmitter's network information to be allocated to the FPGAF unction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connector for DMA transfer on the LLDMA side to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation.
		axFuncti	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional	*map(string)Details *int32 *int32 *int32 *int32 FunctionsDeploySpec *int32 *int32 *int32	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCie connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connection for DMA transfer on the LLDMA side to be given as the sender (For PCie connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of WBFunctions). It depends on the number of channels of the circuit, etc. Maximum number of creasing modules (Functions) that can be written in this region (Number of Functions of Functions - Number of icruits).
	Ma	axFuncti axCapac	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional Optional Optional Optional Optional Optional Required Optional Optional Optional Optional	*map[string]Details *int32 *int32 *int32 *int32 FunctionsDeploySpec *int32 *int32 *int32 *int32 *int32	Transmitter's network information to be allocated to the FPGAF unction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of HBFunctions), it depends on the number of channels of the circuit, etc. Maximum number of processing modules (Functions) that can be written in this region (Number of Functions > Number of circuits)
	Ma	axFuncti	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional	*map(string)Details *int32 *int32 *int32 *int32 FunctionsDeploySpec *int32 *int32 *int32	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DIMA protocol) ID of the DMA channel to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connector for DMA transfer on the LLDMA side to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource appair information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of WBFunctions). It depends on the number of channels of the circuit, etc. Maximum number of processing modules (Functions) that can be written in this region (Number of Functions – Number of circuits). Maximum number of the domain (currently Lane number)
	Ma	axFuncti axCapac	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional Optional Optional Optional Optional Optional Required Optional Optional Optional Optional	*map[string]Details *int32 *int32 *int32 *int32 FunctionsDeploySpec *int32 *int32 *int32 *int32 *int32	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of WBFunctions). It depends on the number of channels of the circuit, etc. Maximum number of DFs installed in the processing module (number of WBFunctions). It depends on the number of channels of the circuit, etc. Maximum processing power (fps) for the entire region Domain name of the domain (currently Lane number) The state of the ChildSer socruce - thave the following four values
	Ma	axFuncti axCapac	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional	*map(string)Details *int32 *int32	Transmitter's network information to be allocated to the FPGAF unction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of HBFunctions). It depends on the number of channels of the circuit, etc. Maximum number of processing modules (Functions) that can be written in this region (Number of Functions - Number of Circuits) Maximum number of the domain (currently Lane number) The state of the ChildBs resource. Have the following four values "NotReady" — Before preparing (before writing child bs)
	Ma	axFuncti axCapac	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional Optional Optional Optional Optional Optional Required Optional Optional Optional Optional	*map[string]Details *int32 *int32 *int32 *int32 FunctionsDeploySpec *int32 *int32 *int32 *int32 *int32	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connection for DMA transfer on the LLDMA side to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of WBFunctions). It depends on the number of channels of the circuit, etc. Maximum number of DFs installed in the processing module (number of WBFunctions). It depends on the number of channels of the circuit, etc. Maximum processing power (fps) for the entire region Domain name of the domain (currently Lane number) The state of the ChildSer socruce - Awa the following four values
	Ma	axFuncti axCapac	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional	*map(string)Details *int32 *int32	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connection for DMA transfer on the LLDMA side to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Both etheropy information of the processing module writter in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of WBFunctions), it depends on the number of channels of the circuit, etc. Maximum number of processing modules (Functions) that can be written in this region (Number of Functions - Number of circuits). Maximum processing power (fps) for the entire region Domain name of the domain (currently Lane number) The state of the ChildBs resource. Have the following four values - "NotReady" — Before preparing (before writing child bs) - "Preparing (child be writing)
	Ma	axFuncti axCapac	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional	*map(string)Details *int32 *int32	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module writter in the function module. The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of WBFunctions), it depends on the number of channels of the circuit, etc. Maximum number of processing modules (Functions) that can be written in this region (Number of Functions - Number of circuits). Maximum processing power (fps) for the entire region Domain name of the domain (currently Lane number) The state of the childs resource. Alwa the following four values "NotReady" — Before preparing (before writing child bs) "Preparing" — Preparing (child bs writting) "Ready" — Enabled (after child bs writte)
	Ma	axFuncti axCapac	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional	*map(string)Details *int32 *int32	Transmitter's network information to be allocated to the FPGAF unction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP), PCle connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCle connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource capacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of WBFunctions). It depends on the number of channels of the circuit, etc. Maximum number of processing modules (Functions) that can be written in this region (Number of Functions - Number of circuits) Maximum processing power (fps) for the entire region Domain name of the domain (currently Lane number) Domain name of the domain (currently Lane number) The state of the childs resource, have the following four values - "NotReady" — Before preparing (before writing child bs) - "Preparing" — Preparing (child bs write is complete) - "Error" Failed to prepar (if child bs write is complete) - "Error" Failed to prepar (if child bs write failed) The write status of child bs corresponding to the ChildBs. Has four values, no more than six values
	Man Nan Status	axFuncti axCapac	PeploySper MaxCa MaxDa	Port DMAChannellD LLDMAConnectorID	Optional Optional Optional Optional Optional Optional Required Optional Optional Optional Optional Optional Required Optional	*map(string)Details *int32 *childBitstreamStatus	Transmitter's network information to be allocated to the FPGAFunction in set with the FuncCHID Details of network information to give as sender. A map where key is the protocol name and value is the detail information. Port number to be given as the sender (For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DMA protocol) ID of the DMA channel to be given as the sender (For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) ID of the connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol) Resource apacity information of the processing module written in the function module The maximum processing power (fps) of the deployed Function of the processing module. It depends on the circuit implementation. Maximum number of DFs installed in the processing module (number of WBFunctions). It depends on the number of channels of the circuit, etc. Maximum number of processing modules (Functions) that can be written in this region (Number of Functions - Number of circuits). Maximum processing power (fps) for the entire region Domain ame of the domain (currently Lane number) The state of the Childbs resource. Have the following four values - "NotReady" — Before preparing (before writing child bs) - "Preparing" — Preparing (child bs writing) - "Roady" — Enabled (after child bs writing) The write status of child bs corresponding to the ChildBs. Has four values, no more than six values - "WritingBistreamFile". Writing bistream file - "Configuring-Parameters". Setting parameters
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■FPGA

custom resource with information on FPGA devices

Automatically generated when infrastructure information collection management is executed and updated when child bs is written

	Name	Туре	Req/Opt	Description
metadata	Name	-	-	Be set by the user
IIIctauata	Namespace	-	-	Be set by the user
	ChildBitstreamID	*string	Optional	id of the child bitstream written to this FPGA device in the.bit file
	DeviceIndex	int32	Required	Serial number on the installed server (as set in the FPGA driver library)
	DeviceFilePath	string	Required	DeviceFilePath for this FPGA device on the installed server
	DeviceUUID	string	Required	FPGA-ID for this FPGA device (as set in the FPGA driver library)
	NodeName	string	Required	Hostname of the server that contains this FPGA device
spec	ParentBitstreamID	string	Required	ID of the parent bitstream written to this FPGA device in the .mcs file
	PCIDomain	int32	Required	Domain number of the PCI in which this FPGA device is inserted
	PCIBus	int32	Required	Bus number of the PCI that this FPGA device is plugged into
	PCIDevice	int32	Required	Device number of the PCI in which this FPGA device is inserted
	PCIFunction	int32	Required	Function number of the PCI in which this FPGA device is inserted
	Vendor	string	Required	Vendor information for this FPGA device
	ChildBitstreamID	*string	Optional	id of the child bitstream written to this FPGA device in the.bit file
	ChildBitstreamCRName	*string	Optional	Information about the ChildBs resource that will be the child CR of this FPGA device
	DeviceFilePath	string	Required	Serial number on the installed server (as set in the FPGA driver library)
	DeviceIndex	int32	Required	DeviceFilePath for this FPGA device on the installed server
	DeviceUUID	string	Required	FPGA-ID for this FPGA device (as set in the FPGA driver library)
	NodeName	string	Required	Hostname of the server that contains this FPGA device
	ParentBitstreamID	string	Required	ID of the parent bitstream written to this FPGA device in the .mcs file
	PCIDomain	int32	Required	Domain number of the PCI in which this FPGA device is inserted
status	PCIBus	int32	Required	Bus number of the PCI that this FPGA device is plugged into
	PCIDevice	int32	Required	Device number of the PCI in which this FPGA device is inserted
	PCIFunction	int32	Required	Function number of the PCI in which this FPGA device is inserted
				The state of this FPGA device. Have the following four values
				· "NotReady" — Before preparing (before writing child bs)
				· "Preparing" — Preparing (child bs writing)
		1		· "Ready" — Enabled (after child bs write is complete)
	Status	FPGAStatus	Required	• "Error": Failed to prepare (if child bs write failed)
	Vendor	string	Required	Vendor information for this FPGA device

■ CPUFunction
custom resource with information about the Function to deploy to the CPU
Sample processing modules include decoding, filter/resize, copy branch, and gleu (dma→tcp).
Converted from WBFunction and auto-generated

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Status Status Status String Optional Paddress Accelerator/Statuses (I_AccStatuses By Container Optional Patition Name Partition Name *string Optional Paddress (I_AccStatuses By Container Optional Container Optional Container Optional Option		Conf	igName	string	Required	
Status AdditionalNetwork *bool Optional Whether to create a 2nd NIC on Pod FunctionIndex in132 Optional Whether to create a 2nd NIC on Pod FunctionIndex in132 Optional Whether to create a 2nd NIC on Pod FunctionIndex in132 Optional Optional The state of CPUFunction on the destination (Equivalent to the parent CR WBFunction.status.RegionName) Status String Required Required Required Paddress Paddress						
FunctionIndex Int32 "int32 Optional Deployed functions on the destination (Equivalent to the parent CR WBFunction.status.RegionName) StartTime metav1.Time Required Feation time Status string Required IPAddress 'string Optional Paddress (Currently nursed) AcceleratorStatuses B] AccStatusesByContainer Optional Paddress (Currently nursed) AcceleratorStatuses [] AccStatusesByContainer AcceleratorStatuses S]	Status					
StartTime metav1.Time Required Ceation time Status string Required PAddress - *string AcceleratorStatuses Optional State of the device that deployed this CPUFunction. It is recorded for each Function (for each container in the case of GPUFunc).						
The state of CPUFunction. Have the following two values The state of CPUFunction. Have the following two values Required Required Required Required Required Required Required Required Pendings creating "I don't use Pending at the moment, I set it to Running after Pod creation is complete. IPAddress Accelerator/Statuses I]AccStatusesByContainer Optional I address (currently unused) Accelerator/Statuses I]AccStatusesByContainer Optional I optional Information identifying the Function for which status is set Statuses I]AccStatuses Optional Information identifying the Function for which status is set AcceleratorID *string Optional Information identifying the Function for which status is set AcceleratorID *string Optional Information identifying the Function for which status is set AcceleratorID *string Optional Information identifying the Function for which status is set AcceleratorID *string Optional Information identifying the Function for which status is set AcceleratorID *string Optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set III optional Information identifying the Function for which status is set in the Function for which status is set in the						
Status string Required Required - Running: successful creation - Pending: Creating -	}	otart	rime	metavi. I ime	Required	
Status string Pending: Creating 'Pending: Creating 'I don't use Pending at the moment, I set it to Running after Pod creation is complete. PAddress						
"I don't use Pending at the moment, I set it to Running after Pod creation is complete.		Statu	us	string	Required	
PAddress						
AcceleratorStatuses []AccStatusesByContainer Optional State of the devic that deployed this CPUFunction. It is recorded for each Function (for each container in the case of GPUFunc). PartitionName	}	IPAH	ldress	*string	Ontional	
PartitionName	ł					
Statuses []AccStatuses Optional Records status for each Accelerator assigned to CPUFunction AcceleratorID *string Optional Device UUID						
AcceleratorID *string Optional Device UUID		ŀ				
			AcceleratorID	-	Optional	
						Device status. Three types (deployed deploying error) are assumed.

■ DeviceInfo

custom resource with information exchanged between WBFunction controller (WF controller) and DeviceInfo controller (DM controller)
WBFunction CRC deletes it when WBFunction CRC finishes processing (various CR creation processing), so it does not exist when DF deployment is completed.

	Nan	ne	Туре	Req/Opt	Description
metadata	Name		-	-	Set arbitrarily by the user.
IIIctauata	Nan	nespace	-	-	Set arbitrarily by the user.
	Poo	uest	WBFuncRequest	Required	Request to reserve or free up deployment space for a device
	iveq	uesi	WBruilchequest	Required	Contains Spec information for WBFunctionCR.
		RequestType	string	Required	Type of processing request to DeviceManager.
		DeviceType	string	Required	Accelerator type.
		DeviceIndex	int32	Required	Device number.
		RegionName	string	Required	A unique name given to a partitioned region on a physical device.
Spec		NodeName	string	Required	Host name.
		FunctionIndex	*int32	Optional	Serial number of the Function to be deployed or deployed.
		FunctionName	string	Required	Name of the Function to be deployed or deployed.
		MaxDataFlows	*int32	Optional	The maximum number of installed DF (WBFunction) for a scheduled or deployed function.
		MaxDatariows	*Int32	Optional	It depends on the number of channels of the circuit, etc.
		MaxCapacity	*int32	Optional	The maximum processing power (fps) of the scheduled or deployed Function.
		Capacity	*int32	Optional	The load of a Function that will or has been deployed.
	Res	ponse	WBFuncResponse	Optional	Result of processing a request to allocate or release a device deployment region.
		Status	string	Required	The processing result for the request.
		FunctionIndex	*int32	Optional	Serial number of the Function that reserved or released the deployment region.
Status		DeviceUUID		Optional	The UUID of the device that reserved the deployment space.
		DeviceooiD	string	Optional	(Stores information only when a request is made to allocate a deployment region)
		DeviceFilePath	atring	Optional	Device file path with allocated deployment space
		Devicer lier attl	string	Ориопаі	(Stores information only when the device is an FPGA and the allocation of the deployment region is

$\blacksquare \\ Ethernet Connection$

custom resource with information about Ethernet connections

Currently, only FPGA (decode) —FPGA (filter/resize) communication is applicable.

Converted from WBConnection and auto-generated

	Nam	e	Туре	Req/Opt	Description
metadata	Nam	e	-	-	Be set by the user
metadata	Nam	espace	-	-	Be set by the user
	Data	FlowRef	WBNamespaecedName	Required	Identification of DataFlow from which EthernetConnection is based
	From	1	EthernetFunctionSpec	Requried	Function CR of the sender of EthernetConnection
Spec		WBFunctionRef	WBNamespacedName	Required	Resource name and namespace of the sending Function.
	То		EthernetFunctionSpec	Requried	Function CR on the destination side of EthernetConnection
		WBFunctionRef	WBNamespacedName	Required	Resource name and namespace of the destination Function.
	Data	FlowRef	WBNamespaecedName	Required	Identification of DataFlow from which EthernetConnection is based
	From	ı	EthernetFunctionStatus	Requried	Function CR of the sender of EthernetConnection
		WBFunctionRef	WBNamespacedName	Requried	
		Status	string	Requried	The deployment state on the SrcFunc side. Have the following three values OK — Deployed INIT: NG: Not deployed *INIT is no longer used.
Status	То		EthernetFunctionStatus	Requried	Function CR on the destination side of EthernetConnection
Ottatus		WBFunctionRef	WBFunctionRef	Requried	
		Status	string	Requried	The deployment state on the DstFunc side. Values and usage status are the same as From.Status above.
	Start	tTime	metav1.Time	Required	creation time of EthernetConnection
	Stati	us	string	Requried	The state of EthernetConnection. Have the following two values Running: successful creation Pending: Creating *Currently I don't use Pending, I just run it after EthernetConnection creation process is complete.

$\blacksquare \mathsf{PCleConnection}$

custom resource with information about PCle connections over shared memory

Currently, it covers FPGA (filter/resize) —GPU (advanced or lightweight inference) communication, CPU (decode) —FPGA (filter/resize), and FPGA (decode) —FPGA (filter/resize).

Converted from WBConnection and auto-generated

	Name		Туре	Pog/Opt	Description
	Name		-	- neg/opt	Be set by the user
metadata	Name		1_	_	Be set by the user
		lowRef	WBNamespaecedName	Required	Identification of DataFlow from which PCIeConnection is based
	From		PCIeFunctionSpec		Function CR of the sender of PCleConnection
		WBFunctionRef	WBNamespacedName		Resource name and namespace of the sending Function.
	То		PCIeFunctionSpec		Function CR on the destination side of PCleConnection
		WBFunctionRef	WBNamespacedName		Resource name and namespace of the destination Function.
	DataF	lowRef	WBNamespaecedName		Identification of DataFlow from which PCIeConnection is based
	From		PCIeFunctionStatus		Function CR of the sender of PCIeConnection
		WBFunctionRef	WBNamespacedName	Required	Resource name and namespace of the sending Function.
			· ·		The deployment state on the SrcFunc side. Have the following three values
					· OK — Deployed
		Status	string	Requried	· INIT:
					NG: Not deployed
					*INIT is no longer used.
	То	L	PCleFunctionStatus	Requried	Function CR on the destination side of PCIeConnection
		WBFunctionRef	WBNamespacedName	Required	Resource name and namespace of the destination Function.
Status					The deployment state on the DstFunc side. Values and usage status are the same as
		Status	string	Requried	From.Status above.
	Share	dMemory	SharedMemoryStatus	Optional	Shared memory allocation status
		Chatan	-4-1	Optional	State of shared memory used by PCIe over shared memory (Allocated Allocating Error)
		Status	string	Optional	(currently unused)
	Start1	ime	metav1.Time	Required	creation time of PCIeConnection
					The state of PCIeConnection. Have the following two values
					Running: successful creation
	Statu	3	string	Requried	Pending: Creating
					*Currently I don't use Pending, I just run it after EthernetConnection creation process is
					complete.

$\blacksquare {\sf Compatible information for FunctionKind identification}$

Information to identify which Function CR (GPUFunction/FPGAFunction) to convert from WBFunction.

Since this information is environment-independent, the following sample data can basically be used as it is.

However, you need to create the file and apply it as ConfigMap.

Nam	е	Type	Req/Opt	Description
Func	tionCRKinds	[]FunctionCRKindInfo		
	DeviceType	string	Required	Type of the destination Device. WBFunction .spec.DeviceType itself.
	FunctionCRKind	string	Required	Function CR type. Currently, the following three types - GPUFunction
	Tanctionortaina	String	ricquired	FPGAFunction CPUFunction

$\blacksquare {\sf Correspondence information for ConnectionKind identification}$

Information to identify which Connection CR (EthernetConnection/PCleConnection) to convert from WBConnection. Since this information is environment-independent, the following sample data can basically be used as it is. However, you need to create the file and apply it as ConfigMap.

Nam	e	Туре	Req/Opt	Description	
Coni	nectionCRKinds	[]ConnectionCRKindInfo	Required		
	ConnectionMethod	string	Required	It represents the From and To connection method and corresponds to WBConnection.spec.ConnectionMethod. Currently, there are two types "host-100gether" (Ethernet connection) "host-mem" (PCIe connection)	
	ConnectionCRKind	string	Required	Type of the Connection CR corresponding to each type of ConnectionMethod. Currently, there are two types - EthernetConnection: "hodt-100gether" support - PCleConnection: Support for "host-mem"	

■infrastructure configuration information

Information to define the hard configuration of each node. Define deployment region information for each device (GPU, FPGA).

It currently covers information about installed devices (GPU, FPGA, CPU, memory).

Automatically generated by the infrastructure information collection management department

	Name	Туре	Req/Opt	Description
	Devices	∏deviceinfo	D in . d	List of device information for devices installed on the node
	Devices	[]deviceinto	Required	(Define the number of devices (Currently FPGA, GPU, CPU and memory) installed in the node)
				Device File Path
	DeviceFilePath	Washington on	0 - 11 1	(Information to identify which device is physical.
Spec	DeviceFilePath	*string	Optional	For the time being, only FPGA can be used. For GPUs, it is not necessary because the device file
Spec				path is not used to physically identify the GPU.)
	NodeName	string	Required	Host name
	DeviceUUID	*string	Optional	Globally unique identifier of the device
	DeviceType	string	Required	Accelerator type
	DeviceIndex	int32	Required	Serial number of the device

■ Deployment Region Information

Information to define the deployable space provided on each node. Define deployment region information for each device (GPU, FPGA). It currently covers information about installed devices (GPU, FPGA, CPU).

Automatically generated by the infrastructure information collection management department

Nar	ne		Туре	Req/Opt	Description	
Dev	Devices		[]deviceregioninfo	Required	List of region information created on the devices installed on the node	
					(Define by the number of devices installed in the node (currently FPGAs, GPUs, and CPUs))	
	NodeN	ame	string	Required	Host name	
	DeviceFilePath		*string	Optional	Device File Path	
	Dovido	1 1101 001	Stillig	Орионы	(information to identify which FPGA device is physically)	
	Device	IIIID	*string	Optional	Globally unique identifier of the device	
	Device	0010	string	Optional	(information to determine which GPU device is physical)	
	FunctionTargets		[]regionIndevice	Required	List with each region information as an element	
	R	egionType	string	Required	region type of the region	
	R	egionName	string	Required	identification of the region	
	N	MaxFunctions	int32	Required	Maximum number of processing modules (Functions) that can be written in this region (Number of Functions = Number of	
	N	MaxCapacity	int32	Required	Maximum processing power (fps) for the entire region	
	F	unctions	[]simplefunctioninfrastruct	Optional ※	Information about functions already deployed in the region	
		FunctionIndex	*int32	Optional ※	Serial number of the function	
		PartitionName	string	Required	Physical information that identifies where the function is actually deployed on the infrastructure	
		FunctionName	string	Required	Name of the function	
		MaxDataFlows	int32	Required	Maximum number of installed DF for the function (number of WBFunction)	
ı		MaxCapacity	int32	Required	Maximum processing power of the function (fps)	

^{*}Required if the device is an FPGA

\blacksquare fixed region information

Information used to identify the RegionType of each region in Lane fixed method $\,$

Since this information is environment-dependent, a file must be created for each worker node in advance according to the environment.

The following is an image of how to use it.

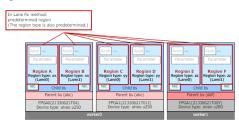
Prepared by someone (such as an infrastructure service administrator)

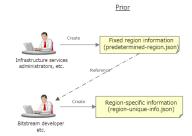
A person (such as a bitstream developer) creates an Region-specific information from this file.

	Name	Туре	Req/Opt	Description	
Pre	eDeterminedRegionInfos	[]predeterminedRetionInfo	Required	List of fixed regions	
	NodeName	string	Required	Host name of the server on which the target region resides UUID of the device on which the region of interest resides	
	DeviceUUID	int32	Required		
	SubDeviceSpecRef	string	Required	Information identifying the target region (lane number for FPGAs, device type (equivalent to DeviceType) for GPUs, "cpu" for CPUs)	
	RegionType	string		Region type of the target region (FPGA: "Device type" - "parent bs" - "Number of lanes" - "Number of nics") Equivalent to DeviceType for CPU/GPU)	

■Remarks

image of how to use





\blacksquare Type 1. Node & device information

List of nodes and information about the devices installed on each node

It currently covers information about installed devices (GPU, FPGA, CPU, memory).

Automatically generated by the infrastructure information collection and management department.

	Name		Туре	Req/Opt	Description
	Devices		∏DeviceInfo	Required	List of device information for devices installed on the node
	Dev	rices	[]DeviceIII0	required	(Define the number of devices (Currently FPGA, GPU, CPU and memory) installed in the node)
			string	Required	Device File Path
		nodeName			(Information to identify which device is physical.
Spec					For the time being, only FPGA can be used. For GPUs, it is not necessary because the device file
Spec					path is not used to physically identify the GPU.)
		deviceFilePath	*string	Optional	Host name
		deviceUUID	*string	Optional	Globally unique identifier of the device
		deviceType	string	Required	Accelerator type
		deviceIndex	int32	Required	Serial number of the device

■ Type 2. Deployment information within the device Information to define the deployment region information for each device (GPU, FPGA, CPU). It currently covers information about installed devices (GPU, FPGA, CPU). Automatically generated by the infrastructure information collection and management department.

Name			Type		Description	Remarks
					List of region information created on the devices installed on the node	
evice	es	[]deviceRegioninfo		Required	(Define by the number of devices installed in the node (currently FPGAs, GPUs, and CPUs))	Define by the devices installed in the node (currently FPGAs and GPUs)
no	nodeName		string	Required	Host name	
de	deviceFilePath		*string	Optional	Device File Path (information to identify which FPGA device is physically)	Information to identify which device the device is physically
de	deviceUUID "string subDeviceSpecRef string		*string	Optional	Globally unique identifier of the device (information to determine which GPU device is physical)	Table. Only for Grids to India. (First As manufacture) and a state of the India. "The first "Grid" in the UIII must be lowercase "gou" Use this value as metadata.name in FunctionTarget, so do not use uppercase characters according to the k8s.
SL			string Required Identification information to identify the region deployed on this device		Identification information to identify the region deployed on this device	Type 3. Reference information for pulling the corresponding region information from the region-specific information. Type 3 also has parameters of the same name.
fu	ınctio	nTargets	[]RegionInDevice	Required	List with each region information as an element	Is it better to use CR's FunctionTarget data structure for each element of the list?
	reş	regionName string Require		Required	identification of the region	In the second half FPGA: Id of Lane (=FrameworkKernelid (=PtuKernelid)) GPU: 0 (fixed 0 is fine because GPU does not divide space)
	fur	functions []simplefunctioninfrastruct Options		Optional %	Information about functions already deployed in the region	Information about previously written circuits. *Also indicate the value of the number of Pod to be deployed (number of elements in functions below) in the region o GPU (as of March 2023).
		functionName	string	Required	Name of the function	
		functionIndex	int32	Required	Serial number of the deployed function	
1	1	frameworkKernelID int32 Required The ld of the kernel for chain control (FrameworkKernel).		The ld of the kernel for chain control (FrameworkKernel).		
		partitionName	string	Required	Physical information that identifies where deployed functions are actually deployed on the infrastructure	- FPGA-FunctionKernelld - GPU — The UUID or ID(0, 1,) of the destination GPU for MPS, or the MIG instance ID for MIG - CPU: NUMA Node, core information, etc. (if available) - For GPU/CPU, may include the identity of the pod (name or UUID)

^{*}Required if the device is an FPGA

■ Type 3. Region-specific information
Information specific to the bitstream/container image, such as FPGA child bitstream and Pod at GPU/CPU time.
Fixed information regardless of environment (destination system). (Once created, it can be deployed horizontally to any environment)
It's pre-created by hand (assuming you're an app developer developing bitstreams and containers).

Name		Туре	Req/Opt	Description	
subD	eviceSpecRef	string	Required	Identification information to identify the region	
functi	onTargets	[]RegionInDevice	Required	List using the region information as an element	
	regionName	string	Required	identification of the region	
	regionType	string		region type of the region	
maxFunctions		int32	Required	Maximum number of processing modules (Functions) that can be written in this region (Number of Functions = Number of	
	maxCapacity int32 Required		Required	Maximum processing power (fps) for the entire region	

■ Type 4-1. Func Specific Information - Common Attributes

Information about the attributes common to all functions that are deployed and executed in the deployment region.

Fixed information regardless of environment (destination system). (Once created, it can be deployed horizontally to any environment)

It's pre-created by hand (assuming you're an app developer developing bitstreams and containers).

O Circuit deployment destination information

Name		Туре	Req/Opt	Description				
Item		[.t.:][]EDOAO.t.l	D	key is the entry number (character string) of the issue information.				
iteiii		map[string][]FPGACatalog	Required	List whose value is FPGACatalog (json format)				
	functionID	int32	Required	Identifier of the function (circuit/container image) (not currently used)				
	functionName	string	Required	such Function name				
	maxDataFlows	int32	Required	Maximum number of DF (WBFunc) that can be deployed to the function				
	maxCapacity	int32	Required	Maximum processing power of the function				

■ Type 4-2. Func-specific - dedicated (filter/resize)
Information about the dedicated attributes required for FPGA decoding and FPGA filter/resize among the functions deployed and executed on the deployment region.
Fixed information regardless of environment (destination system). (Once created, it can be deployed horizontally to any environment)
It's pre-created by hand (assuming you're an app developer developing bitstreams).

ame Type		Req/Opt	Description	
nctionKernels map[string][]FunctionDetail		Required	List of resources in the FPGA provided by each lane of child bs for filter/resize	
partitionName string		Required	Physical information that identifies where the function is actually deployed on the infrastructure	
functi	onChannelIDList	[]int32	Required	List of FunctionChannelID (FuncCHID) provided by this Function
				Details of the resources in the FPGA associated with each FuncCHId
functi	onChannelIDs	FunctionDetail	Required	(For each FuncCHID, the resource in the FPGA to be paid to the FPGAFunc is determined in combination
				with its Id.)
fı	ınctionChannelID	int32	Required	ID of the FuncCH
n		FPGACatalogmapRxTx	Required	Receiving side network information provided to FPGAFunction in set with the FuncCHID
	protocol	map[string] FPGAConnectionCatalogDetails	Required	communication protocol of interest
	port	*int32	Optional	Port number to be given as the receiver
	port			(For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DMA protocol)
	dmaChannelID	*int32	Optional	ID of the DMA channel to be given as the receiver
	ulliaciialilleliD			(For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol)
	fdmaConnectorID	*int32	Optional	ID of the connector for DMA transfer on the LLDMA side to be given as the receiver
	IdillaCollileCtoriD			(For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol)
b	tx map[string] FPGAConnectionCatalogDet		Required	Transmitter's network information given to the FPGAFunction in set with the FuncCHID
	protocol	string	Required	communication protocol of interest
	port	*int32	Optional	Port number to be given as the sender
	port	IIII.32		(For Ethernet connections (protocol is TCP/RTP). PCIe connection (not used with DMA protocol)
	dmaChannelID	*int32	Optional	ID of the DMA channel to be given as the sender
	umachanneliD			(For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol)
	fdmaConnectorID *int32		Optional	ID of the connector for DMA transfer on the LLDMA side to be given as the sender
	Tulliaconnectorio	IIIIJZ	Optional	(For PCIe connections (protocol is DMA). Ethernet connection (not used with TCP/RTP protocol)