SOFTWARE PLATFORM FOR VOLCANO VIDEO MONITORING

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" Xkf gq"qdugtxcvkqp"ku"vj g"v{ r g"qh"kpuvtwo gpvcn'qdugtxcvkqpu"wugf "vq"o qpkqt"cpf "xkuwcn'guvko cvg"vj g" uvcvg"qh'xctkqwu"qdlgevu."kpenwf kpi "pcwtcn'qdlgevu"uwej "cu"xqnccpqgu0"Wukpi "vj g"xkf gq"cco gtc"cnqy u'tgeo qvg" cpf "r go cpgpv'qdugtxcvkqpu"qh'cp"qdlgev'cpf ."cnuq."cpcn{ kpi "ej cpi gu'kp"ku'uvcvg."cpf lqt'cp"qeewttkpi "gtwr vkqp" dcugf "qp"c"ugv"qh'ko ci gu0"

" Qy kpi "vq"j ki j "cevkxkv{ "qh'Mco ej cvmc"xqncpqgu"cpf "vj g"pgeguukv{ "vq"eqpf wev'vj gkt"uwf kgu"cpf "qr gtcvkxg" o qpkqtkpi ."ko r rgo gpvkpi "vj g"o wnkhwpevkqpcn'xkf gq"qdugtxcvkqp"u{uvgo "ku"eccttkgf "qw"d{ "vj g"Iqkpv'ghhqtvu"qh" Mco ej cvmcp"Xqncpkc"Gtwr vkqp"Tgur qpug"Vgco "*MXGTV+']I ktkpc"gv'cn"4229_'qh'vj g"Kpuvkuwg"qh'Xqncpqnqi { " cpf "Ugkuo qnqi {."vj g"Hct'Gcuvgtp"Dtcpej ."Twuukcp'Cecf go { "qh'Uekgpegu."*KXU'HGD'TCU+."cpf "vj g"Eqo r wkpi " Egpvgt."Hct'Gcuvgtp"Dtcpej ."Twuukcp'Cecf go { "qh'Uekgpegu."*EE'HGD'TCU+0'Kp"qtf gt"vq"xkuwcn'o qpkqt"vj g" uvcvg"qh'Uj gxgnwej ."Mn{ej gxumq{."Cxcej kpum{"cpf "I qtgn{'xqncpqgu."9'xkf gq"cco gtcu"j cxg"dggp"kpuvcngf " ukpeg"F gego dgt."4229 ."kp"vj g"ugwgo gpv'qh'Mn{ej k'cpf "vj g'ekv{ "qh'Rgvtqr cxnqxum/Mco ej cvum{0'Cnm'cco gtcu" ctg"eqppgevgf "vq"EE'HGD'TCU'F cvc'Egpvgt"*Mj cdctqxum+0'

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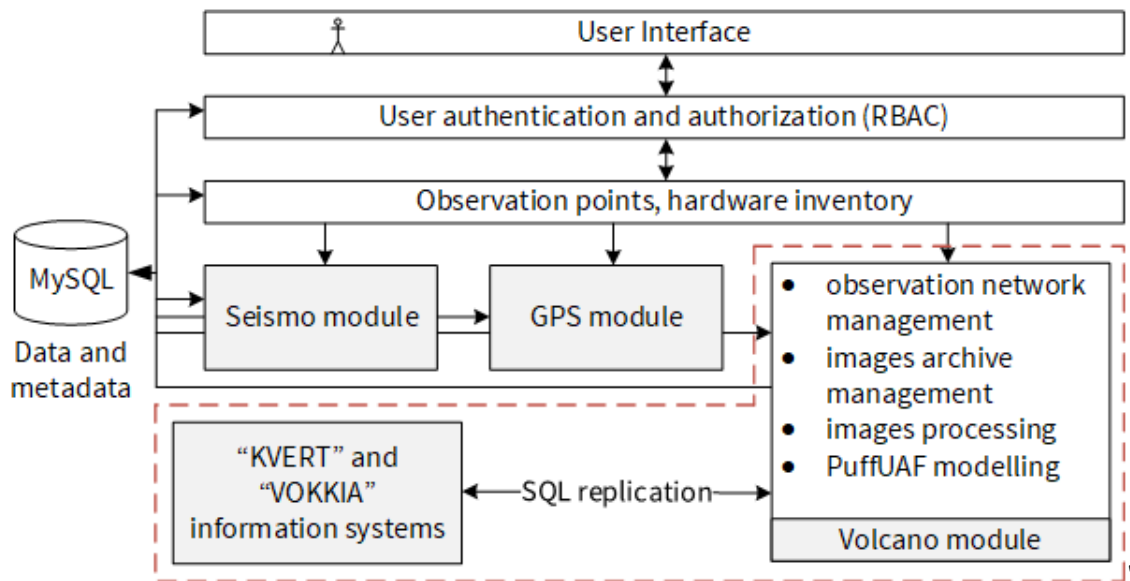

Fig. 1. General "Signal" architecture with volcano video module integrated

Network inventory module. Vj g"o qf wg"r tqxkf gu'dcuke"kphtcuvtwewtg"qr gtcvkqpu"kpenwf kpi <"

− dcuke"o gvcf cvc"o cpci go gpv'qh'wuwf kgf "qdlgevu="

− xkf gq"cco gtcu"kpxgpvqt{="

− qdugtxcvkqp"r qkpv'kpxgpvqt{="

− tqng/dcugf "ceeguu'eqpvtqn'qh'u{uvgo "qdlgevu'cpf "f cvc"ctej kxg"ceeguu0'

Metadata synchronization subsystem. XQMMIC"*Xqncpqgu"qh'vj g"Mwtkrg/Mco ej cvmc"Kurcpf "Cte+"]Tqo cpqxc"gv'cn0'4234_'cpf "MXGTV'kphqto cvkqp"u{uvgo u"ctg"vj g"o ckp"uqwteg"qh'Mco ej cvmc"xqncpqgu" o gvcf cvc"cpf "vj gkt"cewucn'uvcvg"f cvc0'Vj g"o qu'ko r qtvcpv'kphqto cvkqp"ku'ewttgpv'Cxkcvkqp"Eqmqt"Eqf g"qh'vj g" xqncpq."eqpegtpgf "y kvj "cxkcvkqp'uchgv{ "kp'vj g"tgi kqp"cpf "cuuwo gf "vq"dg"wugf "cu"vj g"hqto cnli gf "kpf kecvqt"qh" vj g"xqncpq"uvcvg."cpf "uj "glgevkqpu'f cvc"kpenwf gf "kp"Xqncpq'Qdugtxcvqt{"P qvkeg"hqt"Cxkcvkqp"*XQP C+"]I qtf ggv'gv'cn"4236_0'Cm'vj ku'f cvc."r tqf wegf "d{ "MXGTV'uekgpvkuu'cpf "tgeqtf gf "vq"o cuvgt"f cvcdcug."ku' cwqo cvkecm{ 'tgr rkecvgf "vq"uncxg'f cvcdcug'qh'õUki pcnö0'C'tcvgo gpv'dcugf 'O {US N'tgr rkecvkqp"cr r tqcej "ku'wugf " i kxkpi "vj g"hqmqy kpi "cf xcpvci gu<"

"
- pgy "f cvc"ku"cxckncdng"tki j v"chtygt"r wdnkecvkqp."kQg0'vj gtg"ku"pq"pggf "vq"ej gem"pgy "f cvc"cxckncdknkv{"
  r gtkqf kecm{="
- f wg"vq'O{ US N'tgr nkecvkqp"ctej kvgewtg."kv'ku"tgukuvcpv'vq"eqo o wpkecvkqp"gttqtu="
- kv'j cu'vj g"uo cmguv'ko r cet'qp"kphqto cvkqp"u{uvgo u'vq"kpvgi tcvg0'

"   Qpeg"f cvc"ku"tgr nkecvgf "vq"uncxg/ugtxgt."c"ur gekcn'f gxgnqr gf "tki i gt"wugf "vq"ttcpuhgt"kv'vq"eqttgur qpf kpi "
uwdu{uvgo u'cpf'o qf wngu<Cxkecvkqp'Eqpqt'Eqf g'ku'wugf "vq"eqpvqr'ko ci g'hgvej "tej gf wtg"*vj g'o qtg"cevkxg"xqrecpq"
ku."vj g'o qtg"htgs wgpvt'hgvej "uj qwnf "dg"r gthqto gf+."cuj "enqwf "o gvcf cvc"ku"wugf "vq" uko wncvg"ku"r tqr ci cvkqp"f wtkpi "
pgzv'r gtkqf "qh"vko g0'

Image fetch subsystem. Vj g"uwdu{uvgo "r gthqto u"r gtkqfke"hgvej "cpf "uvqtci g"qh"ko ci gu"htqo "xkf gq"
eco gtcu0Hgvej "r gtkqf "ku"f ghkpgf "d{ "o gvcf cvc"u{pej tqpkzcvkqp"uwdu{uvgo "kpf kxkf wcm{ "hqt"gcej "xqrecpq"dcugf "
qp"ku"ewttgpv'Cxkecvkqp'Eqpqt'Eqf g0'Chvgr"vj g"ko ci g'j cu'dggp"hgvej gf "cpf "hwtvj gr"ctej kxgf ."cr r tqr tkg"ko ci g"
o gvcf cvc"*vj g"qdugtxcvkqp"qdlgev."xkf gq"eco gtc"KF ."hgvej "tko g."ksk g+"ku"r qr wncvgf "kp"TF DO U0Hgvej gf "ko ci gu"
ctg"cnuq"ugtko cvgf "d{"f khhgtgpv'o gvtkeu"kp"ur gekcn{ gf "r tqeguukpi "o qf wng0'

F wg"vq"ko kvgf "dcpf y kf vj "qh"Y CP "pgvy qtm'nkpmu"cv'r ncegu."y j gtg"xkf gq"eco gtcu"ctg"kpuvcmgf ."kv'ku"
uqo gvko g"pqv'ko r quukdng"vq"hgvej "ko ci gu"y kj "ugeqpf "tko g"tguqnwkqp0Vq"grko kpcvg"vj ku'ko kxcvkqp."c"ur gekcn'
ctej kxg"cr r tqcej "ku"f gxgnqr gf "pqy 0Vj g"o ckp"kf gc"ku"vq"hgvej "ko ci gu"y kj "ugeqpf "tko g"tguqnwkqp"r gtkqf "wukpi "
j ki j"ur ggf "nqecn'nkpm'cpf "vj gp"cr r n{ "ur gekcn'twngu'dcugf "qp"u{pej tqpk{ gf "o gvcf cvc"vq"r wti g"nqecn'ctej kxg"cpf "
vtcpuo kv'qpn{ "o quv'ko r qtvcpv'ko ci gu"vq"F cvc"Egpvgt."ucxkpi "pgvy qtm'dcpf y kj 0"

Image processing module. O cpwcn'cpcn{ g"qh'ctej kxgf "xqrecpq"ko ci gu"ku"xgt{ "ncdqtkqwu"cpf "tko g/
eqpuwo kpi "vcum0'Dgukf gu"vj cv."ecr vwtgf "ko ci g"kphqto cvkxkv{"eqwf "dg"chhgevgf "d{ "f khhgtgpv'hcevqtu"*y gcvj gt"
eqpf kkqpu."gve0+0'Kp"qtf gr"vq"wpguwkxqecm{ "kf gpvkh{ "cpf "encuukh{ "vj g"ko ci g"vj cv"ctg"pgkj gr"s wcnkvcvkxg"pqt"
kphqto cvkxg."y g"ctg"f gxgnqr kpi "vj g"cni qtkjo u"cpf "o gvj qf u"hqt"gxcnwcvkqp"qh"xqrecpq"ko ci g"cpf "vj gkr"
ko r tgo gpvcvkqp"cu"vj g"ko ci g"r tqeguukpi "o qf wng0]Mco cev'gv'cn'423: _0'Y j krg"ctej kxkpi "ecr vwtgf "ko ci g."
o qf wng"cpcn{ gu"vj g"eqpvqwt"xkukdknkv{"qh"vj g"xqrecpq"hqt"fc{/ko ci g"ko ci gu"cu"y gm'cu"vj gto cn'cpqo cnkgu"hqt"
pki j v'ko ci gu"qp"KT/hknngt"gs wkr r gf "eco gtcu0'Tguwnvu"ctg"tgeqtf gr"vq"ko ci g"o gvcf cvc"cpf "ecp"dg"wugf "hqt"
hcuv'cpcn{ g"qh"xqrecpq"cevkxkv{"wukpi "ko ci g"ctej kxg0

Ash propagation modelling module. Y j gp"o gvcf cvc"u{pej tqpk{ cvkqp"uwdu{uvgo "tgegkxgu"XQP C "
o guuci g"eqpvckpkpi "gtwr vkqp"dcukuc"kphqto cvkqp"*f cvg."ko ci g."f wtcvkqp."r nwo g"j gki j v+."vj g"o qf gnkpi "ku"ecrt{ kpi "
qwv'vq"ecrewncvg"cuj "enqwf "vtclgevqt{"f wtkpi "pgzv'r gtkqf "qh"ko g0'Rwhh/WCH"o qf gnku"wugf "]Uqtqmkp"gv'cn'4238_0'
O qf gnkpi "tguwnvu"ctg"tgeqtf gf "vq"I KH'LRI ."MO N'hkngu"cu"y gm'cu"vq"TF DO U'hqt"hwvwtg"o cr r kpi "wukpi "Y HU"
kpvgthceg0

REST API module. Qdugtxcvkqp"pgvy qtm'kpxgpvqt{"fcvc."ctej kxgu"ko ci gu"cpf "vj gkr"o gvcf cvc."cuj "
r tqr ci cvkqp"o qf gnkpi "tguwnvu"ctg"cxckncdng"vj tqwi j "ur gekcn'o qf wng."r tqxkf kpi "J VVR/dcugf "TGUV"CRK'
]Mqtqngx"gv'cn'423: _0'Wukpi "uvcpf ctf 'I GV/s wgt{"qpg"ecp"s wgt{"kphqto cvkqp"kp"LUQP "hqto cv0'Vj g"hqmqy kpi "
WTNu"ctg"cxckncdng"cu"hqt"pqy <

WTN"	F cvcugv"
/volcanoes	Xqrecpq"hwm'nkuv"
/volcanoes/#id	Xqrecpq"o gvcf cvc"d{ '*#id*
/cameras	Xkf gq"eco gtcu"hwm'nkuv"
/cameras/#id	Xkf gq"eco gtc"o gvcf cvc"d{ '*#id*
/photos	Ko ci gu"ugctej "
/tasks	Cuj "r tqr ci cvkqp"o qf gnkpi "tguwnvu"hwm'nkuv"
/tasks/#id	Cuj "r tqr ci cvkqp"o qf gnkpi "tguwnv'd{ '*#id*

Vj g"f gxgnqr gf "CRK'ctg"wugf "cu"qpg"qh"vj g"f cvc"uqwtegu"kp"c"eqo r tgj gpukxg"kphqto cvkqp"u{pvgo "XqnUcVkgy "
hqt"o qpkqtkpi "Mco ej cvnc"xqrecpqgu"]I qtf ggx"gv'cn'4238_0'Dcugf "qp"vj g'lqkpv'cpcn{ uku'qh'f cvc'qdvckpgf "wukpi "
xctkqwu't{r gu"qh"qdugtxcvkqpu"y j kej "kpxqnxg"xkf gq"qdugtxcvkqpu."go qvg"ugpukpi "f cvc."eqo r wvg"o qf gnkpi ."
gve0"vj g"u{uvgo "cmqy u"eqo r ngz"kpxguvki cvkqp"qh'Mco ej cvnc"xqrecpqgu0'

"   Vj g"etgcvgf "xkf gq"qdugtxcvkqp"uqhwy ctg"r ncvhqto "cmqy u"vj g"uqnwkqp"qh"vj g"pgeguuct{ "ugv'qh"r tqdngo u"
vj cv'ctg"tgncvgf "vq"vj g"egpvtcnk{ gf "ko ci gt{ "o cpci go gpv."ugctej kpi "hqt"vj g"ko ci gu"kp"vj g"f cvcdcug."cpf ."cnuq."
vj gkr"vtcpuo kvcpeg"vq"vj g"gzvgtpcn'ur gekcnk{ gf "kphqto cvkqp"u{uvgo u"hqt"hwtvj gr"lqkpv'cpcn{uku"kp"eqo dkpcvkqp"
y kj "vj g"f cvc"qdvckpgf "wukpi "qvj gr"v{r gu"qh"qdugtxcvkqpu"hqt"Mco ej cvnc"xqrecpqgu0"

"   Vj g"uwf kgu"y gtg"uwr r qtvgf "d{ "vj g"Eqo r ngz"r tqi tco "qh"hwpf co gpvcn'tgugctej "HGD"TCU"ëHct"Gcuvì"
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Kpuvkwwg''qh''Xqrecpqnqi { ''cpf ''Ugkuo qnqi { ''HGD''TCU.''Rgvtqr cxnqxum/Mco ejcvum{.''Twuukc.''42 yj /48 yj ''Cwi wuv.''423: ''

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